The NATIONAL GEOGRAPHIC MAGAZINE

Vol. XVIII AUGUST, 1907 No. 8

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THE NATIONAL GEOGRAPHIC MAGAZINE

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SCENES FROM EVERY LAND

By GILBERT H. GROSVENOR
Editor of the National Geographic Magazine

OWING to the large advance subscription to "*Scenes from Every Land,*" which will be published by the National Geographic Society in the fall, we have been able to arrange for a larger and handsomer publication than had been intended. The volume will contain 250 illustrations, nearly all being full page. It will be bound in olive-green buckram, in such form as to be very durable. The book will contain a small chart of the world in five colors, to serve as a guide to the illustrations, and a bibliography of the best books descriptive of foreign countries, natural history, and general geography, including gazetteers and atlases. The volume will be 7x10¼ inches, and is being printed on the same superior paper used by the Magazine. The price of this unique and valuable volume is $1.00, postpaid, and as the **EDITION WILL BE LIMITED,** your order should be sent in at once on the blank below. The volume will be delivered about September 30.

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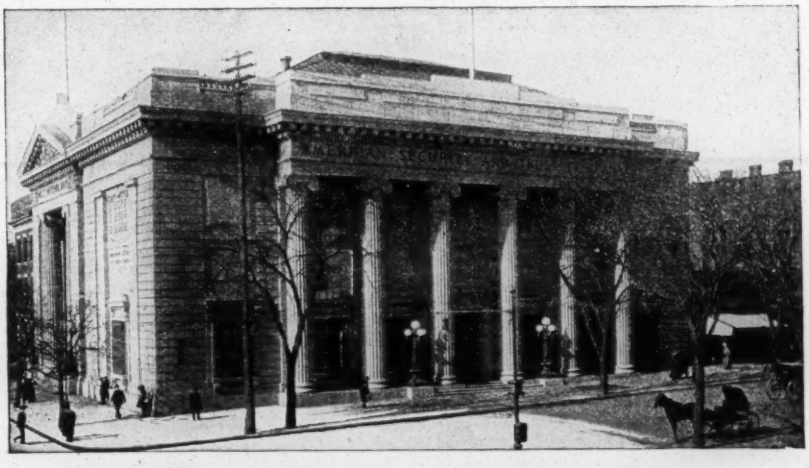

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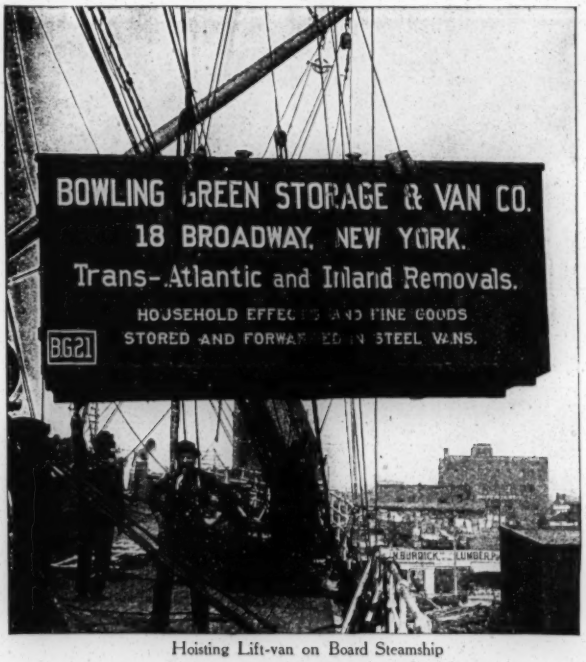

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VOL. XVIII, No. 8 WASHINGTON AUGUST, 1907

THE NATIONAL GEOGRAPHIC MAGAZINE

MEXICO—THE TREASURE HOUSE OF THE WORLD*

BY N. H. DARTON

GEOLOGIST, U. S. GEOLOGICAL SURVEY

THE great development of Mexico's resources during the last thirty years has justified to a large degree the statement of Baron von Humboldt that "Mexico is the treasure house of the world." Her rich silver mines have continued to produce in increasing amount, gold has become an important product, and she has taken prominent rank in the copper industry. Her agricultural products have gained rapidly in value, manufacturing has increased to an encouraging extent, and commerce with the outside world has multiplied many fold.

Foreign capital has flowed into the Republic, especially in later years, and many investors, confident of a continuance of the present stable conditions, are eagerly taking advantage of the many mining, railroading, manufacturing, and other openings which are available. The finances of the country are on a most satisfactory basis, many great public improvements have been made, and the government is offering encouraging facilities along all lines of development. Colonists are coming slowly, but as the conditions become better known they will undoubtedly take advantage of the large areas of public lands that are easily obtainable and in many regions can be utilized with great profit.

The native labor is increasing in effectiveness, for many of the laboring people are showing considerable capability as workmen and artisans when properly trained. Lawlessness is no longer a menace to person or property, railroads are rapidly penetrating all parts of the country, and conditions of living are greatly improved.

There is but a relatively small proportion of Mexico which is unhealthful to foreigners, and many improvements have been made in this regard, notably in draining the overflow area about the City of Mexico.

With her wide range of altitude, latitude, and rainfall, Mexico presents various climatic conditions with a corresponding variety of agricultural possibilities. She has large areas suited for wheat, corn, and other products of the temperate zone, and in the hot, moist lowlands can raise a great variety of

* An address to the National Geographic Society, April 5, 1907

Photo from Mrs Alexander Graham Bell

In the Suburbs of Mexico City

valuable tropical plants. Irrigation will reclaim many thousand acres in the north-central arid districts. Water power is available for manufactures, considerable coal exists in certain areas, and it is believed that petroleum may occur in sufficient amount to be an important auxiliary fuel.

THE PRINCIPAL SILVER-PRODUCING COUNTRY OF THE WORLD

Probably the most valuable resources in Mexico are the great mineral deposits, and mining will long continue to be her principal industry. For many years Mexico has produced more silver than any other country, and now is gaining rapidly in output of gold, copper, and other metals. In 1906 the estimated value of her mineral production was $150,000,000 (Mexican), of which about two-fifths was silver. During the past few years numerous old Mexican mines have been revived, some of the abandoned ones pumped out, and modern methods installed. Large bodies of mineral have been discovered at many new localities. In some cases these yield rich ores, while in others they are of moderate richness, but can be worked profitably by new processes.

The extension of the railroad lines in various directions through the mineral country has been an important factor in development, for they afford outlet for ores which are not sufficiently rich to carry long distances by wagons or burros in the old-time manner. Smelters have been erected at many places and additional ones are in course of construction for the economical working of ores of various kinds. Modern methods of concentration are introduced at some mines, which effect a saving so great that low-grade ores formerly thought to

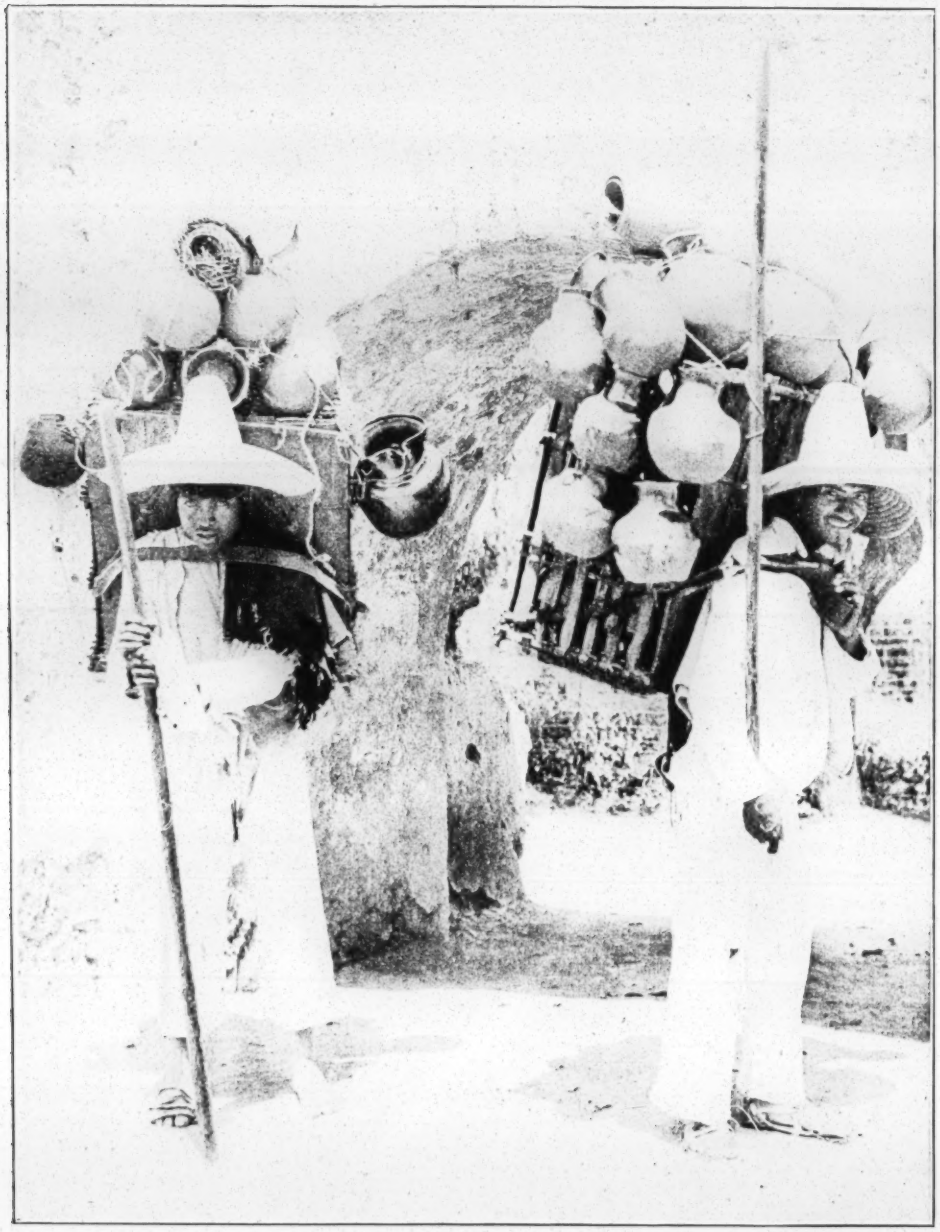


Photo from Graham Ker

Pottery Vendors

Photo from Mrs Alexander Graham Bell

Indian Types

be of no value often can be worked with considerable profit. There are vast quantities of refuse and tailings from old mines and primitive reduction works which contain large values, and some of these are being worked over with most satisfactory results. Often the fairly good ore was discarded in the early days, when only the high-grade material was worth freighting. On the old dumps at one mine in San Luis Potosi there were over 300,000 tons of mine refuse containing much metal. In Guadalajara tailings have been used for asphalt paving which recently were found to run $15 a ton in gold and silver. Electricity, generated mostly by water power, is now being utilized at some mining districts and proves to be a great source of economy.

It is estimated that about $80,000,000 of United States capital are invested for purchase and equipment of Mexican mines and large amounts have also been invested from other countries. The present high price of the various metals has given impetus to Mexican mining, while the large amount of capital available in the present high tide of prosperity in the United States has been an important factor. The known mineral districts in Mexico are numerous and extensive and many portions are by no means fully developed. There are numerous regions also in which the mineral resources may prove important which have not as yet been explored by skilled prospectors.

The following table, taken from the *Mining World* for January 26, 1907, gives the principal metal production of Mexico for the past 27 years:

Metal Production of Mexico

Year.	Gold.	Silver.	Copper.	Lead.
	Fine.	*Fine ozs.*	*Met. tons.*	*Met. tons.*
1880..	$989,160	19,334,707	407	.....
1881..	858,909	21,265,052	339	.....
1882..	936,223	22,465,430	408	.....
1883..	956,000	22,720,004	497	.....
1884..	1,183,000	20,944,185	295	.....
1885..	867,000	24,674,011	378	.....
1886..	614,000	25,356,196	254	.....
1887..	824,000	28,867,830	2,083	15,488
1888..	974,000	31,789,739	2,811	28,636
1889..	700,000	42,657,583	3,841	25,570
1890..	767,000	39,127,481	4,396	22,399
1891..	1,000,000	40,723,598	5,209	30,186
1892..	1,147,500	45,333,786	7,916	47,532
1893..	1,305,000	44,071,851	9,607	60,525
1894..	4,500,000	46,730,151	11,959	57,000
1895..	5,600,000	50,890,267	11,958	68,000
1896..	6,075,108	41,373,835	11,338	63,000
1897..	7,121,189	54,052,647	11,553	71,637
1898..	8,236,720	56,859,076	15,919	71,442
1899..	9,277,351	55,032,838	19,310	84,656
1900..	9,409,063	55,804,420	22,473	63,827
1901..	10,329,316	55,152,340	33,943	94,194
1902..	10,153,100	60,176,604	36,357	106,805
1903..	10,677,500	70,499,942	46,040	95,134
1904..	12,605,300	60,808,978	51,760	101,131
1905..	15,261,200	54,652,893	70,010	96,628
1906..	16,250,000	54,500,000	61,706	78,026

The silver mines of Mexico have been the principal source of her income from mining for over a century, and they are likely to continue their large and gradually increasing production for a long time to come. Some of the old mines have had phenomenal production, notably the group in Zacatecas, which has yielded about one billion dollars; the Santa Eulalia mines, 15 miles east of Chihuahua, 400 millions, while several scores of others have many millions to their credit. Some of the mineral deposits are over 100 feet in width and are traceable for long distances across the country. They occur mostly in volcanic rocks or in limestones associated with them. The minerals present considerable variety and usually are very irregularly disseminated. Many large masses of rich ore occur, and these "bonanzas," as they are termed, have added greatly to the profit and excitement of the mining operations. Some of them have yielded over a million dollars a month for several years. They are often widely separated by lean ore, a condition which has caused the failure of many companies lacking means to continue working under disadvantageous circumstances. Water has often caused failure or great expense, especially when old-fashioned pumps were in use.

At present the most productive silver and gold mines in Mexico are at Guanajuato, El Oro, Pachuca, Santa Eulalia, Parral, and Zacatecas. At the first-named place there has been rapid development; about 2,000 tons of ore a day are now produced and 650 stamps are dropping in the various mills. The crude, wasteful methods of the past have given place to modern ones. Ores carrying 20 dollars a ton, which formerly yielded only a small margin of profit, are now mined and milled for 10 dollars a ton. For many ores plate amalgamation and cyaniding are taking the place of the old patio process, with great increase in yield and saving of time and expense. The patio process was invented in Mexico over three centuries ago and has been used for the greater part of Mexico's silver output. In this process the ore is ground fine in mills, mixed with water, and, after the addition of salt, sulphate of copper, and mercury, it is spread about a foot deep in paved courts, or "patios," 30 to 100 feet square. Here it is stirred for several weeks by the tramping of horses or mules, so that the silver will combine with the quicksilver. When this combination is effected the dirt is washed off and the heavy amalgam remains. The latter is collected and the silver and mercury are easily separated.

Gold occurs under various conditions. The principal source has been in connection with the silver ores, but placer deposits are worked in the states of Sonora and Guerrero. Large veins of gold-bearing quartz exist, and although they are mostly of low value, eventually they will add greatly to the output. The group of mines in and near El Oro, in the State of Mexico, is one of the largest gold camps in America, with an output

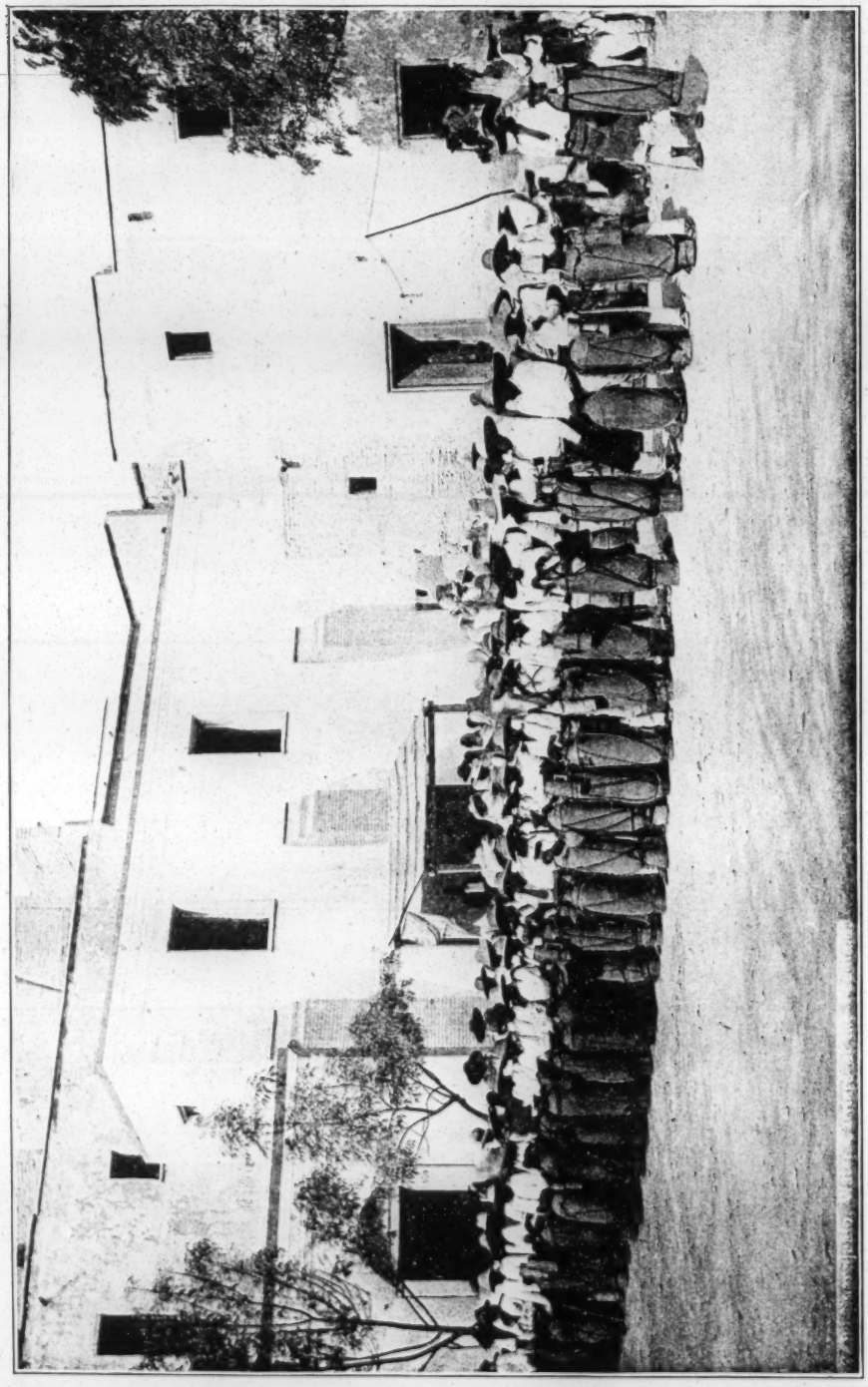
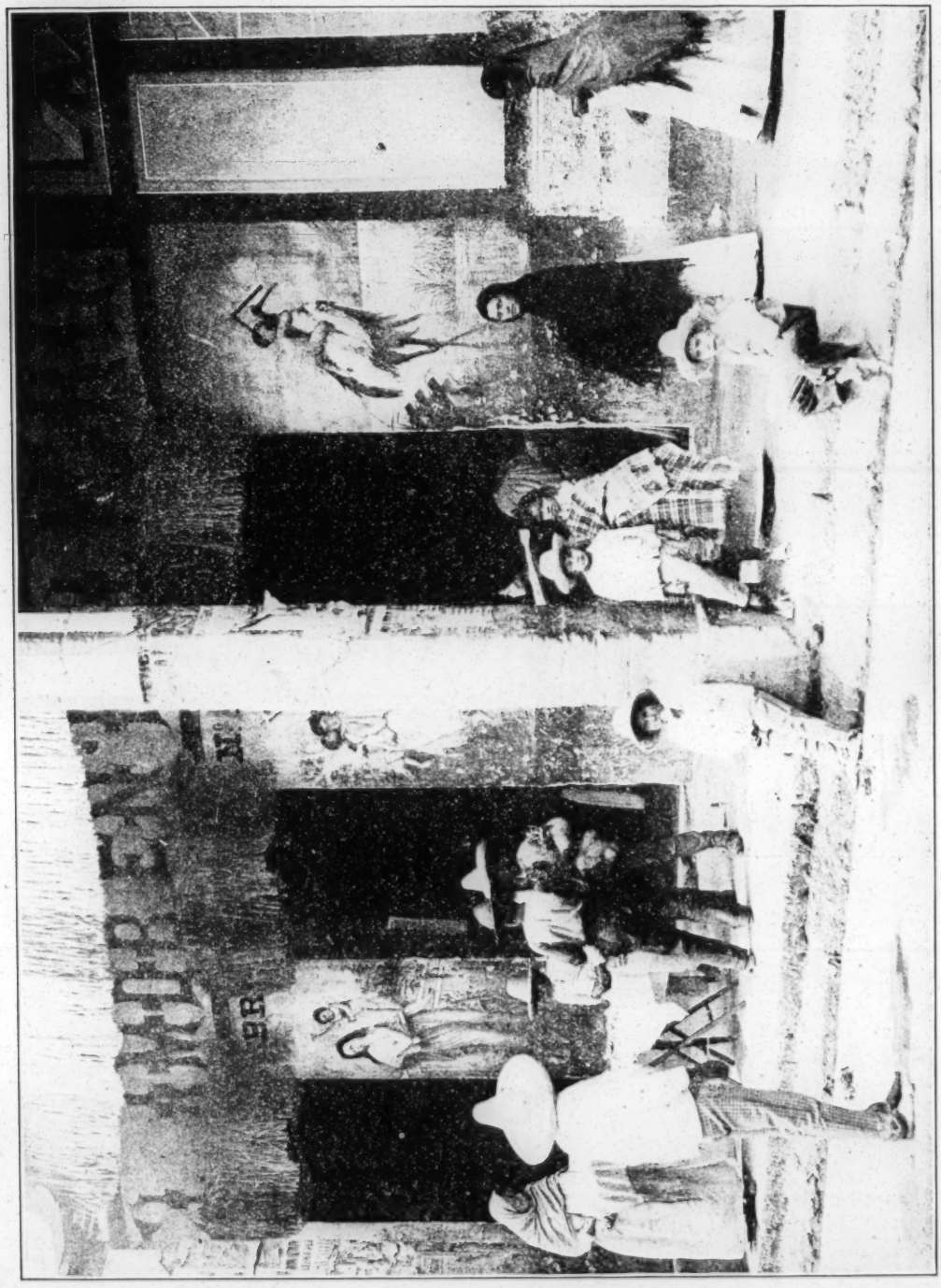


Photo from Mrs Alexander Graham Bell

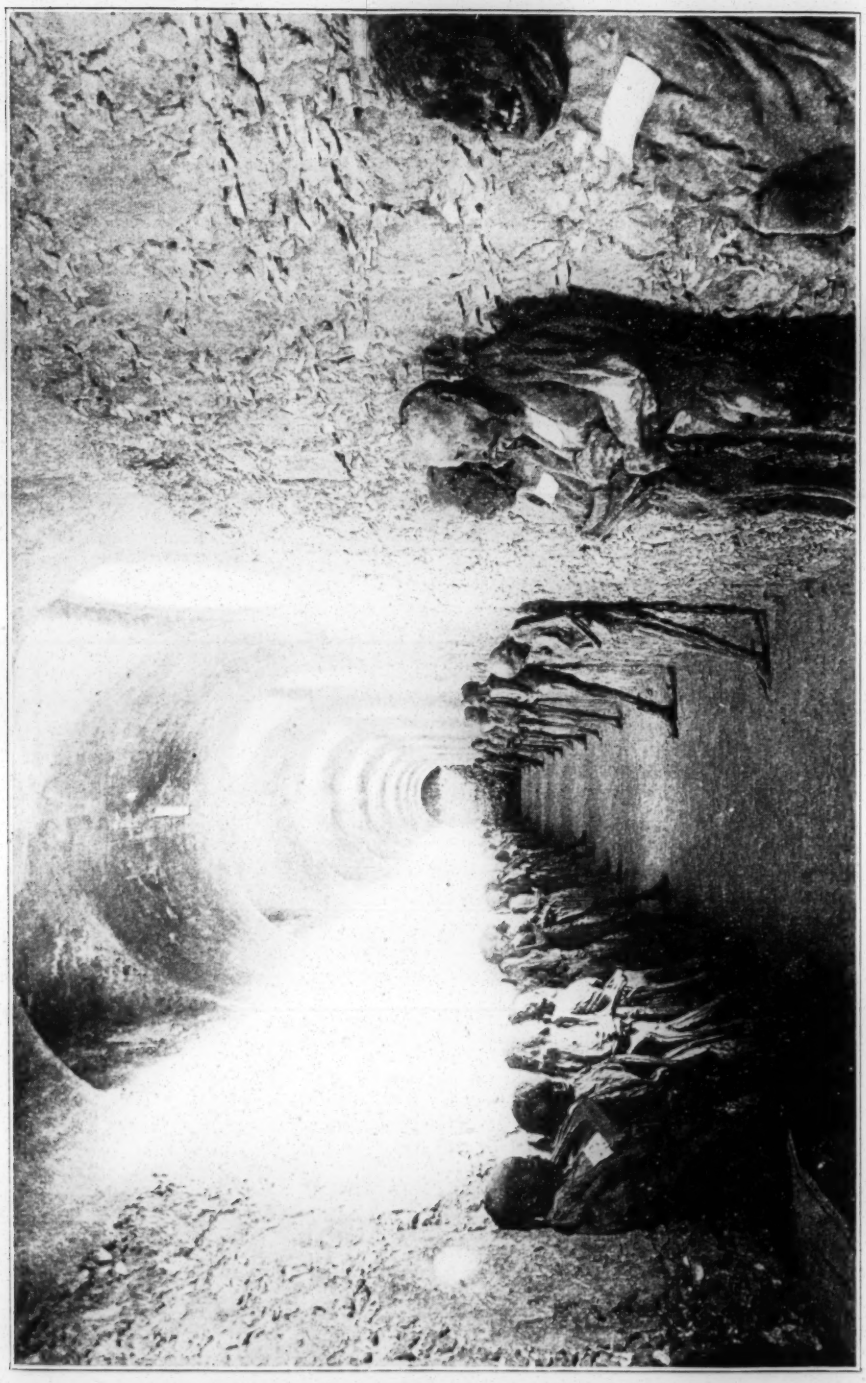
Water Carriers at the Fountain—Guanajuato



A Pulque Shop

Photo from Graham Ker

Organ Cactus—Mexico



Waiting the Judgment Day, in the Cemetery, Mexico City

The Yucca, or Spanish Bayonet, Native of the Plains of the Ser

Photo from Mrs Alexander Graham Bell

Boy Drawing Pulque, the Common Drink of Mexico

Photo from Graham Ker

A Mexican Senorita

in 1906 of over $12,000,000 (Mexican), of which 80 per cent is gold.

Some of the Mexican mines pay remarkable dividends. The Dos Estrellas, in the El Oro district, has recently been paying over a million dollars a year on a capital of $300,000, and it is claimed that the Penoles mine has paid nearly 4 millions on $125,000 capitalization. The Real del Monte, near Pachuca, has distributed over 3 millions to holders of 2,554 shares. The total dividends of 22 prominent paying mines of silver, gold, and copper in 1905-1906 were more than 31 million dollars. The Department of Fomento has estimated that up to 1881 the total production of precious metals in Mexico had a coinage value of $4,553,859,113.

Copper mining in Mexico is rapidly growing in importance, as the figures given on a previous page will show. In 1906 she produced about one-twelfth of the copper of the world, or nearly one-seventh as much as the United States. The mines are mainly in the states of Sonora and Lower California, a southward continuation of the great copper-bearing zone of the southwestern United States. About 11 mines are reputed to produce over a million pounds each a year. It is claimed that the Cananea camp will increase its production this year to six million pounds a month, as a result of a combination of several mines and increased facilities for mining. Increased developments in Guerrero, at Boleo, at Jimulco, at Panuco, and in Zacatecas, Coahuila, Puebla, and Michoacan will add greatly to the future output. The mines at Cananea rank seventh among the leading copper mines in the world. Most of the copper ores range from 3 to 40 per cent of copper and they often carry gold and silver. Many of the deposits, especially those of moderate richness, are thick, numerous, and have great length.

ABUNDANCE OF IRON

The iron industry is growing steadily, and eventually can supply all Mexican needs and probably furnish products for export. At the famous "Iron Mountain" in Durango, the ore body is over a mile long, one-third of a mile wide, and rises 200 to 400 feet above the surrounding plain. The ore body is split by a great intrusive dike, but there are over 360 million tons in sight and much of it reaches 60 per cent in iron content. The two great deposits operated for the furnaces at Monterey are 79 and 120 feet wide and rise in a ridge several hundred feet high. Steel rails and structural iron are now being produced at this place. There are many other large deposits in the Republic, but some of them are too remote from fuel to be valuable under present conditions.

Lead from Mexico has a value of $8,000,000 to $10,000,000 a year and much of it is a by-product of silver smelting.

Zinc is constantly gaining in importance as a mineral resource, and this metal and graphite, antimony, and mercury have an aggregate value of several million dollars a year.

The mining laws of Mexico have been improved from time to time, until now, with some recent changes, the conditions are even more favorable and encouraging than they are in the United States. Foreign investments are amply protected, especially if they are legitimate ones. There are various taxes on mining properties and output and an export duty on silver. The taxes are thought to be too heavy by some of the companies, but it is believed that probably they will be reduced eventually, so that they will not be burdensome.

Labor is somewhat scarce in parts of Mexico, which is a serious handicap to the development of mines and other resources. In order to better this condition, the government is encouraging immigration, and it is expected that soon more laborers will be available. Most labor in Mexico is furnished by the half-breeds and Indians, many of whom are not very efficient, according to northern standards. They work for long hours and low pay, but require many holidays and other vacations. They

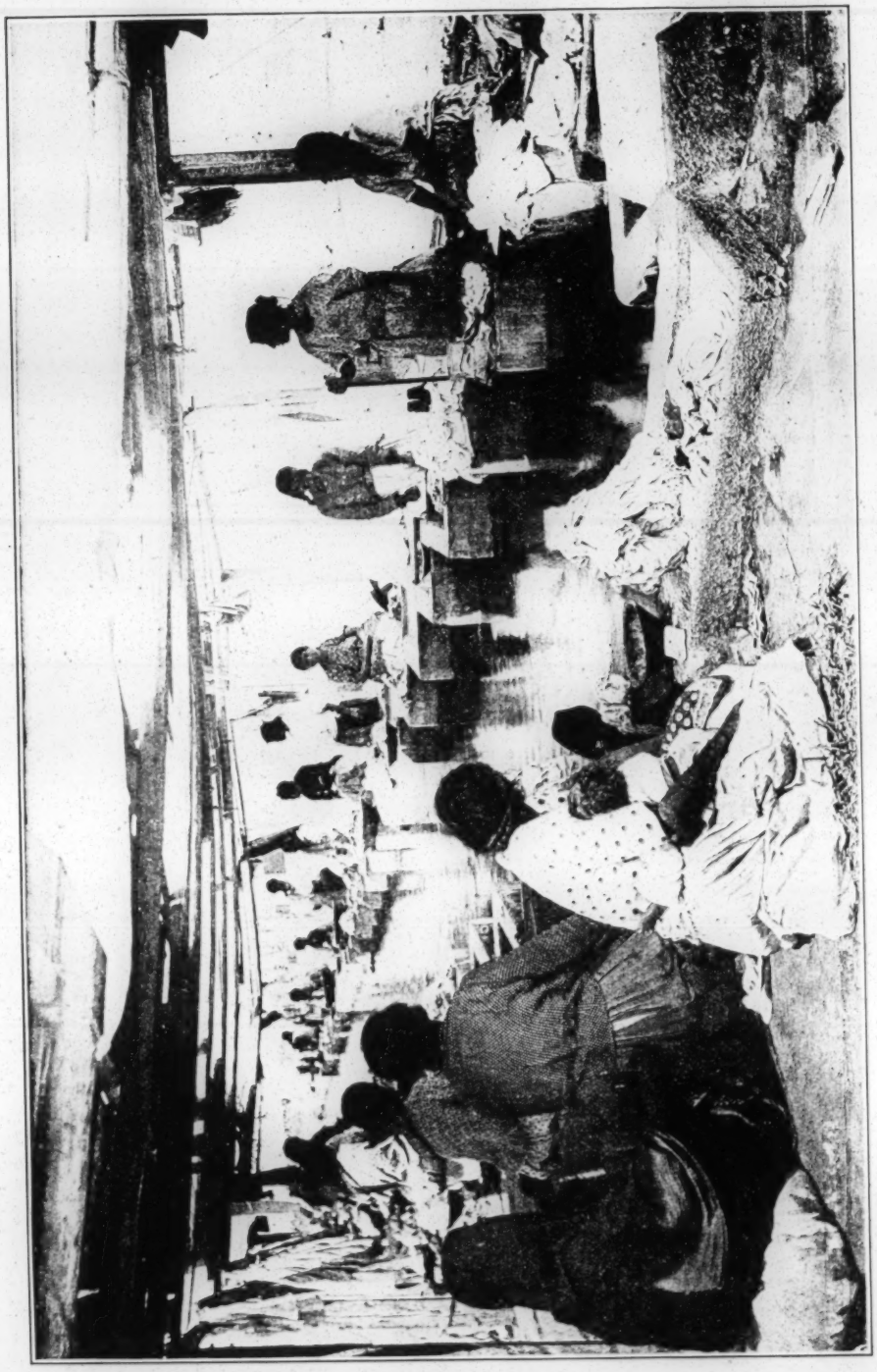
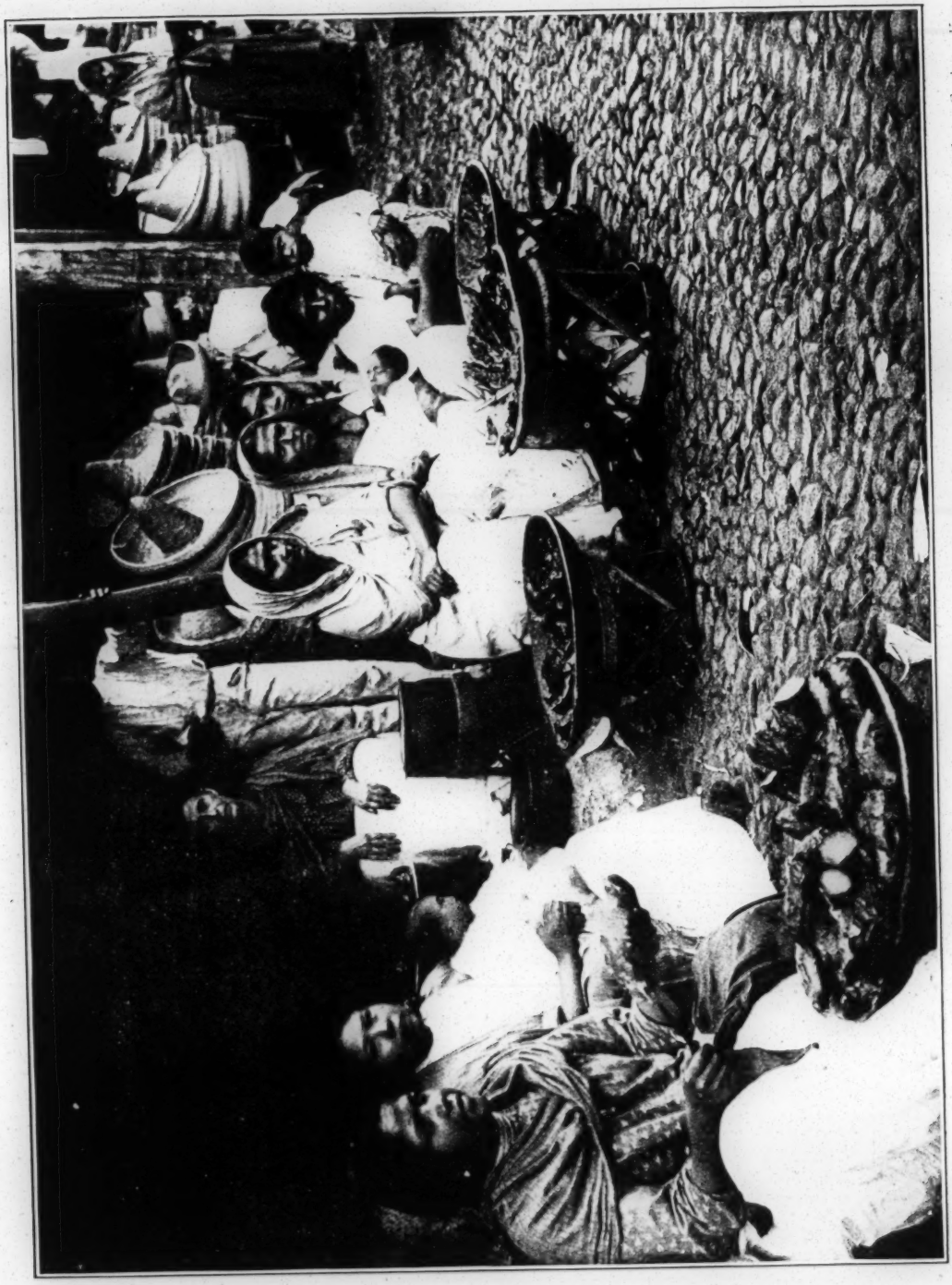


Photo from Graham Ker

The Public Laundry



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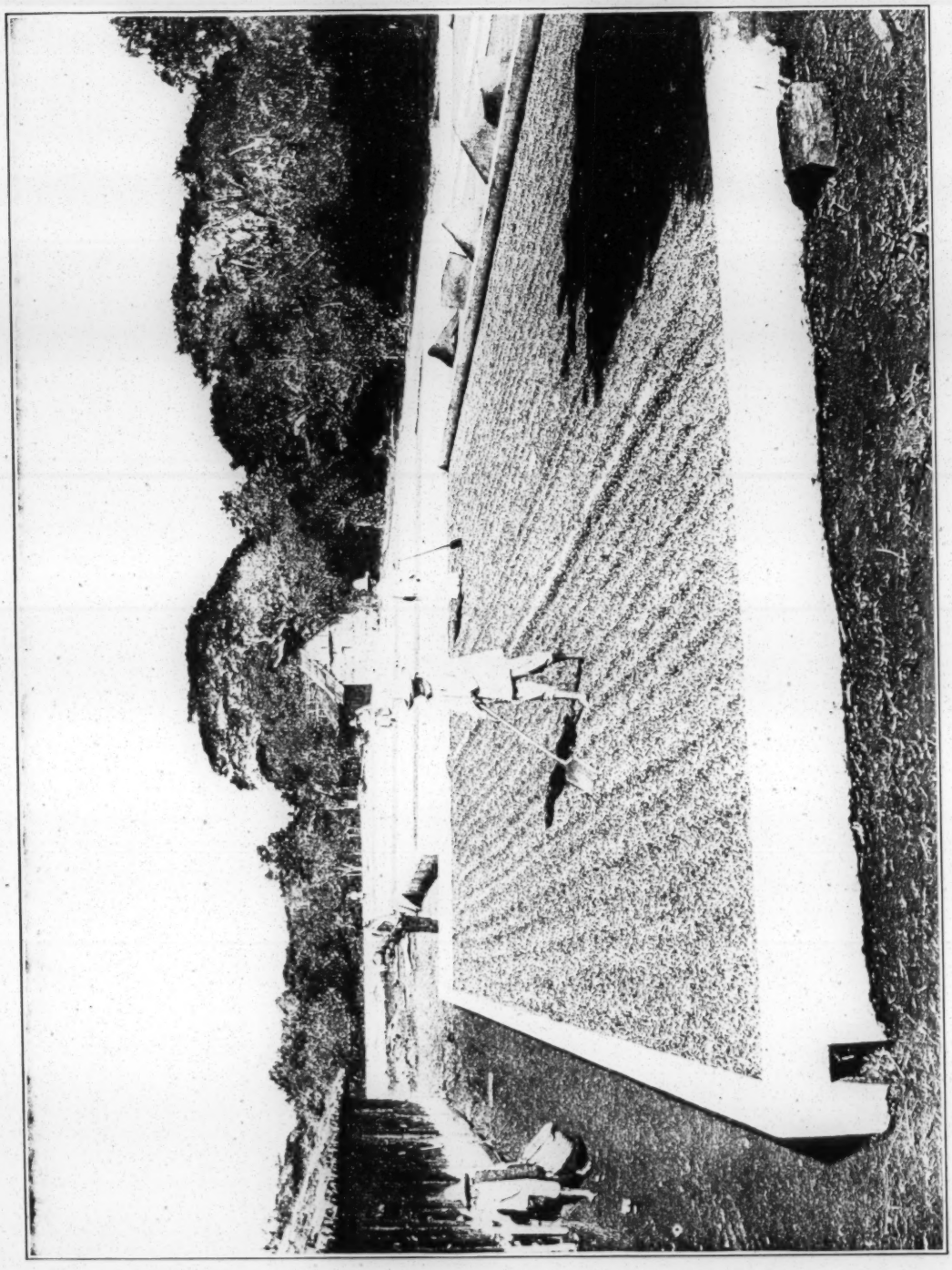
Market Scene in Colima, Mexico

Photo from Graham Ker

Going After Cocoanut Milk

A Mexican Senor

Photo from Graham Ker



Drying Coffee on a Large Mexican Plantation Photo from Mrs Alexander Graham Bell

Photo from Graham Ker

Guadalupe Hidalgo

Photo from Graham Ker

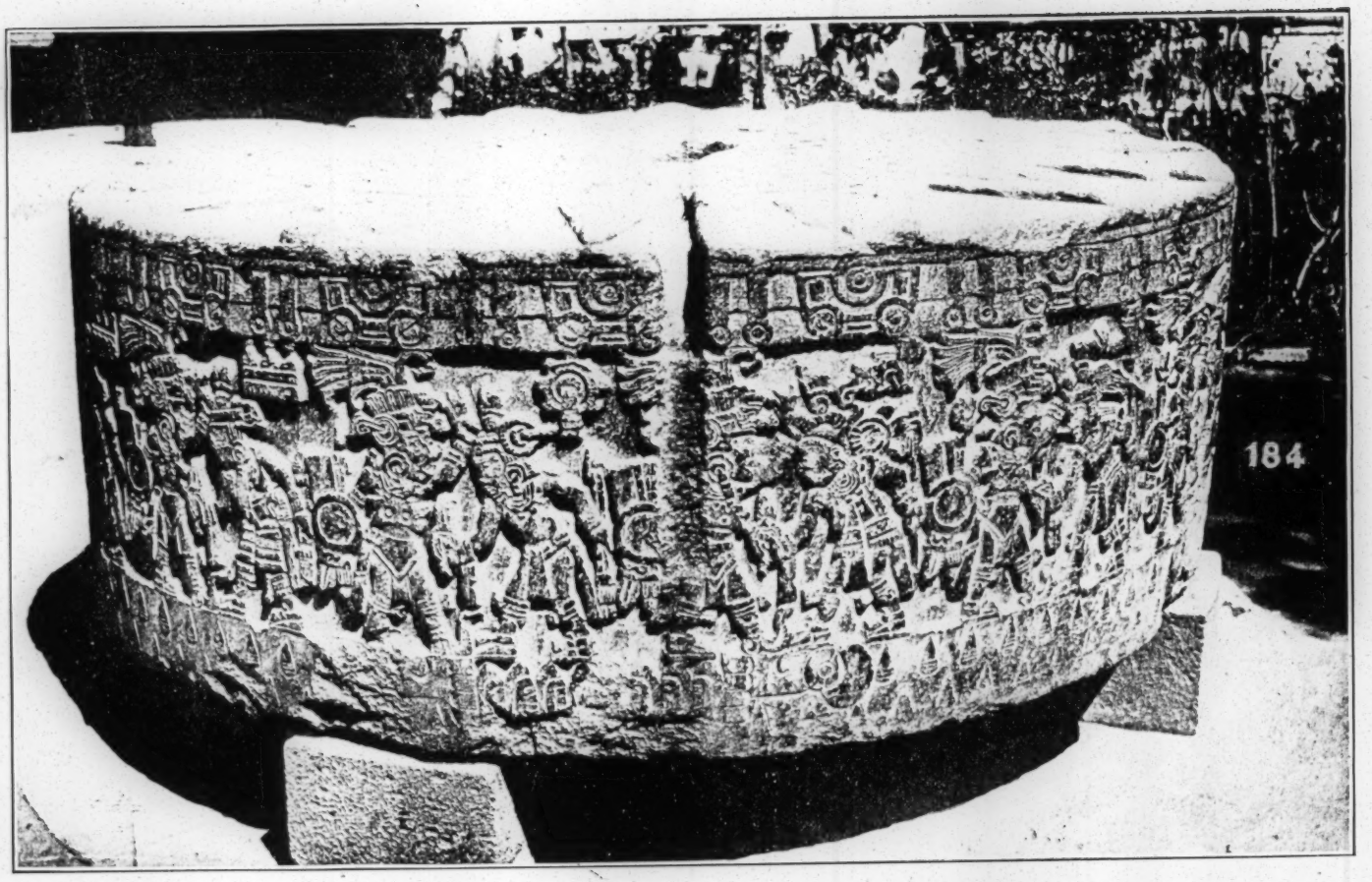
A Girl from Yucatan

Photo from Graham Ker

Tehuana Indian Girl

Photo from Consul E. H. Thompson, Yucatan

Types of Mestizos (White Father and Indian Mother), Yucatan



Sacrificial Stone

Photo from Graham Ker

At a time when most of Europe was in utter darkness, when the "Parisii" lived in caves and the Gauls in "wattled huts," the priests and rulers of Yucatan lived in stone temples and palaces

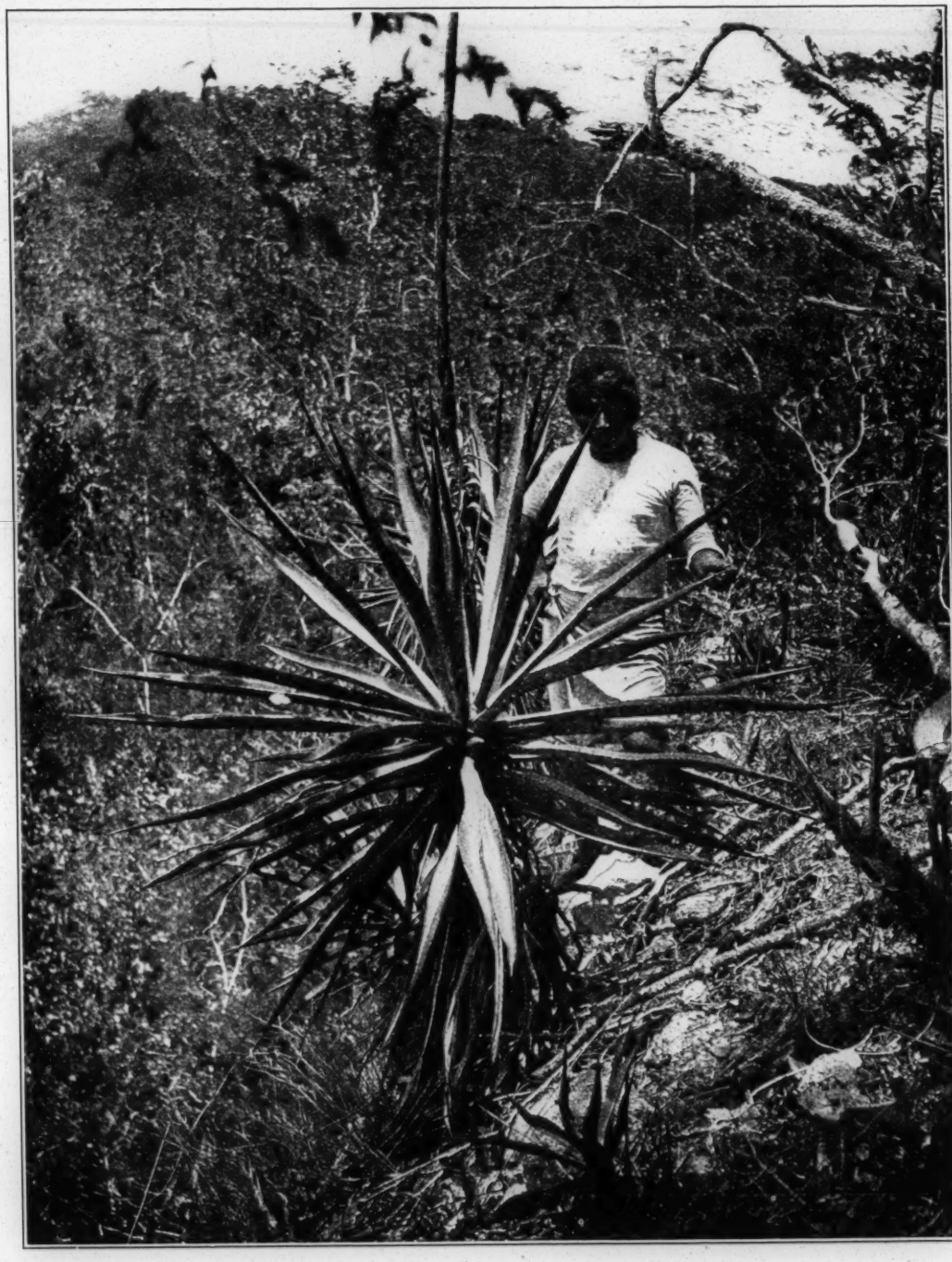


Photo from Consul E. H. Thompson, Yucatan

A Wild Agave Plant—Yucatan

This plant has made Yucatan one of the richest states of Mexico. From it the sisal fiber is obtained, which is used for sacking cordage and binders' twine. Yucatan exports about $13,000,000 worth of the fiber to the United States annually

excel in mining and do well in dealing with live stock.

In recent years the total commerce of Mexico, comprising imports and exports, has amounted to about 180 millions (gold), and it has had a steady growth to about six times its amount 20 years ago. The exports have an approximate value of 100 millions (gold), or about 4 times the amount 20 years ago. The approximate value of exports to the United States is 65 millions (gold). About 60 per cent of the exports are mineral products. Henequen and other fibers are over 18 per cent (over 18 million dollars, gold); coffee, 5 per cent; cattle and other live stock, 3½ per cent; hides, 3½ per cent; wood and dyewoods, 1½ per cent; cocoa, 1½ per cent; rubber and tobacco, 1 per cent each; chicle and vanilla, 1½ per cent.

AGRICULTURAL RESOURCES

I have not given any special attention to agricultural conditions in Mexico, but many facts are available which indicate plainly that the products of vegetable growth will eventually be the source of greatest income and prosperity, for they will be everlasting. A large percentage of the population are agriculturists, and while a considerable acreage is cultivated, it is a small proportion of the area of the Republic. Further expansion of the industry will depend in large measure on colonists and irrigation. Present production is greatest in the lowlands, where there is a constant high temperature and abundant rainfall. In this region grow a great variety of tropical plants which are the source of large income to the Republic. The fiber plants, which flourish in the lowlands, rank highest in value, notably the henequen fiber, a variety of hemp, which has been exported from Yucatan to a value of 300 million dollars in the last 25 years. It is reported that the exports of this material from the port of Progresso in 1906 had a declared value of 26 million dollars (Mexican); a large part of it comes to the United States.

Cotton is an important Mexican product, but the amount raised has not been sufficient for home consumption. The yearly crop is valued at nearly 10 million dollars (Mexican), and about 2 million dollars' worth additional is imported from the United States. The extent of the industry is indicated by the fact that more capital is invested in cotton mills than in any other single manufacture in the country. The principal production is in Coahuila and Durango, but the plant is raised in other states also. It is certain that the cultivation could be greatly increased, for extensive areas are either suited to cotton at present or could be made available by irrigation.

Corn and wheat are important crops in the higher regions, between altitudes of 6,000 and 9,000 feet, and while their gross value is over 125 million dollars they do not fully supply the local demand. It is believed that a very large area is suitable for the growth of cereals, especially with the aid of irrigation, so that eventually they will be important items of export.

Coffee production, which at present has a value of about 3 million dollars, is likely to increase very greatly, for many areas are suited to the growth of the plant and Mexican coffee is rapidly gaining favor in the market. The same statements may be made regarding tobacco and cocoa. The sugar product is valued at 25 million dollars a year, not counting the rum which is distilled. Undoubtedly sugar-beets will thrive in portions of Mexico and can be made an important resource.

Rubber has long been one of the minor products of the lowlands of Mexico, and many new plantations have been started in the past few years. As about 10 years are required for the development of the trees, the new projects have not added greatly to the output. It is stated that about 50 companies have set out 25 million trees. These are planted about 650 to the acre. In the past two years a large amount of rubber has been produced from a shrub known as guayule. The value of this product in 1906 was nearly one million dollars in gold.

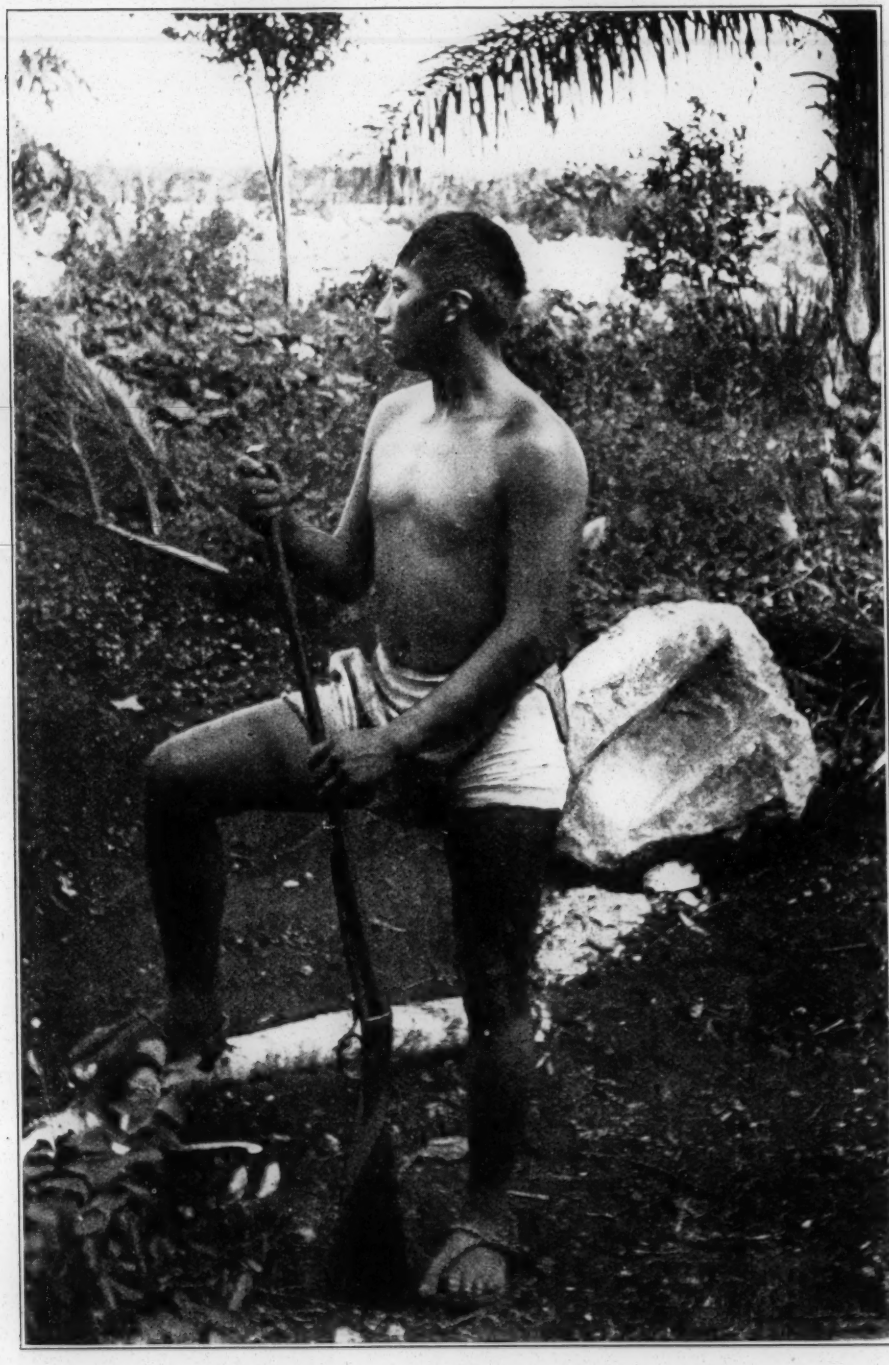


Photo from Consul E. H. Thompson, Yucatan

A Native Maya Indian of Pure Blood, Yucatan

Mexico has very extensive water-power possibilities. The many streams rising in the highlands of the central area fall rapidly in the region of steep slopes descending to the lowlands. A fall of 200 to 500 feet to the mile is frequent. Some of this power is now utilized and transmitted as electricity to various mills and cities. Soon 50,000 horse-power will be carried to the federal district and 30,000 horse-power to Guadalajara. Several plants now furnish electricity to mines.

Irrigation has been practiced in Mexico for many centuries, but on a relatively restricted scale and usually in places where the engineering difficulties have not been great. Large water supplies remain to be utilized, and when suitable reservoirs and ditches are constructed, there can be reclaimed an acreage comparable to that which is now being provided by our own Reclamation Service. Under the favorable conditions of mild climate and rich soil, the products of irrigation will be very valuable. It is safe to predict that the water that can be used in this manner will prove to be one of Mexico's most important resources.

Underground waters are also a resource that will be found of increasing value for stock, domestic use, and irrigation. In many portions of the Republic the geologic structure is favorable for artesian and other wells which eventually will be sunk. There are a few flowing wells at various points and they furnish a portion of the supply for the federal district.

Many sections of Mexico were well forested originally, but large areas have been devastated, especially near the cities and mines and in connection with some kinds of agriculture. The government has taken the matter in hand and created two large forest reserves. Many valuable timber trees grow in the Republic and now are a source of large income. There are good prospects for the future of the lumber industry when reforesting is effected and the forests are placed under suitable control.

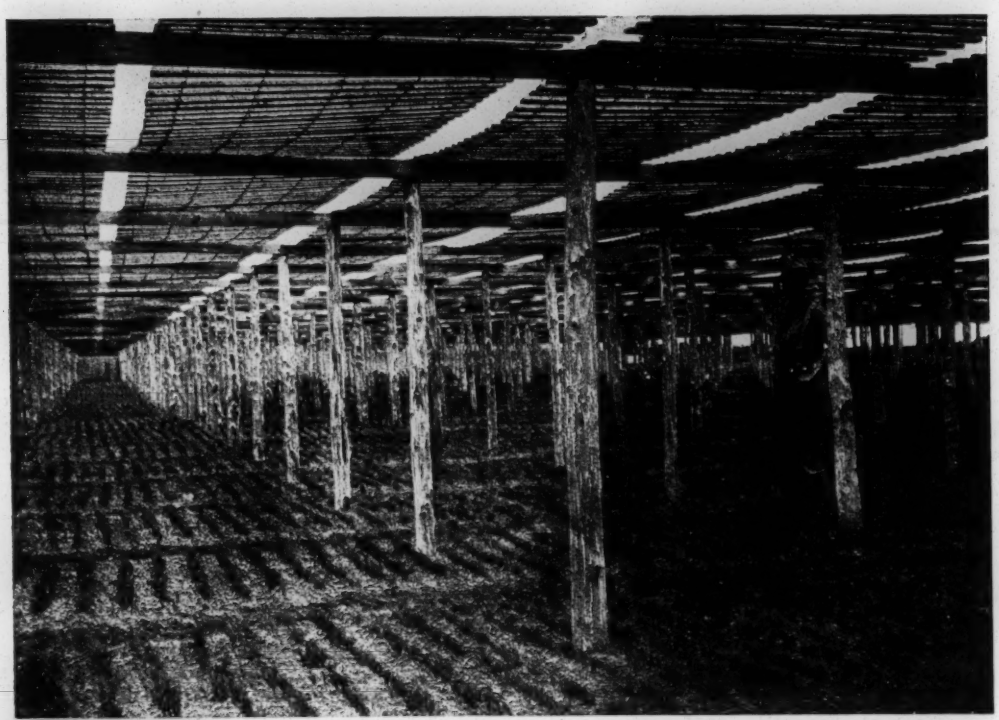
Live stock has always been one of Mexico's most valuable resources and at present is estimated to have a total value of about 125 million dollars (Mexican). Over two-thirds of this is cattle, with the remainder horses, mules, sheep, goats, hogs, and asses. There are wide cattle ranges now largely utilized, but if water were obtained by dams or wells, extensive additional areas could be made available in northern Mexico. Meat is a much more important food element in Mexico than is generally supposed and home consumption is large. Formerly most Mexican cattle were of low grade, but of late a large amount of high-class breeding stock has been imported with the view of raising the standard. By this means much better markets can be secured and the industry placed on a more profitable basis.

SAVING THE FORESTS*

By Herbert A. Smith, Editor of the Forest Service

UNCLE SAM, who is the largest landowner in the world, is the third largest timberland owner. The forests of the Russian government reach the enormous total of nearly 600,000,000 acres. This is almost equal to all the forests in the United States, public and private. In Canada the Dominion government holds about 180,000,000 acres of commercial timberland. Our own national forests now contain over 150,000,000 acres—an area equivalent to all the Atlantic states from Maine to Virginia, inclusive, and

* A description of the work of the U. S. Forest Service, which has charge of government resources valued at $1,500,000,000



Photos from U. S. Forest Service

A Nursery of Bull Pine Seedlings Two Months Old

Tanks for treating telephone poles with preservatives. One of the principal offices of the U. S. Forest Service is cooperating with railroad and telephone companies to obtain better methods of preserving timber

Photos from U. S. Forest Service

A Middle-aged Forest of Norway Spruce, Owned by the Austrian Government

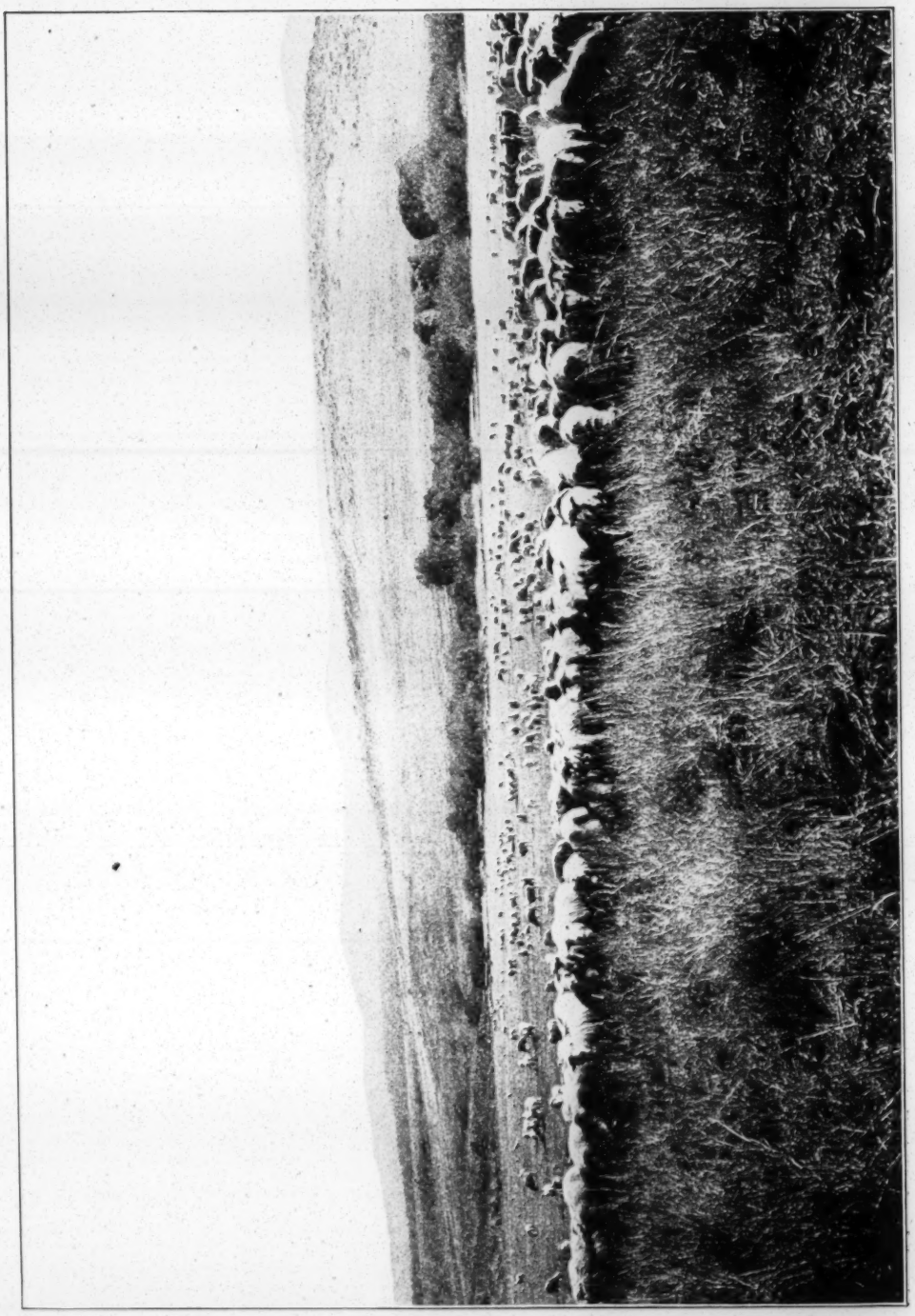


Photo from U. S. Forest Service

An Illustration of Overgrazing

The sheep sweep the land as clean as a prairie fire

a large part of West Virginia. In this are included two forests, aggregating about 5,000,000 acres, in Alaska, and one of 66,000 acres in Porto Rico. Hawaii and the Philippines also have forest reserves, and the forested public lands in the Philippines are supposed to amount to over 50,000,000 acres; but in both of these cases the land belongs, not to the United States, but to the insular governments. If it were a question not of government ownership, but of total timbered area, the United States would stand next to Russia.

How much unreserved timberland the government owns it is impossible to say. Outside of Alaska, however, the total is unimportant in comparison with the national forests. More complete knowledge will doubtless bring to light more or less which should be added to the present forests. On the other hand, these forests now include many interior holdings and claims. Their area is subject to still further future reduction by the location of new mining claims and the exclusion of land found to be agricultural. It is no part of the government policy to try to grow trees on land which can be used to better advantage in other ways; so wherever the prospector can find paying mineral and the homesteader can find land worth farming permanently the national forest gives way.

It must also be remembered that by no means all the land in these forests is forested. In many cases the unforested condition is temporary; the original growth has been swept away, usually by fire, but can and will be brought back in time. But a good deal of the land can never grow anything. The national forests lie mainly upon the mountain ranges of the West. As these rise to alpine altitudes, the timber is left behind, and a point is reached where there is only bare rock and perpetual snow.

No exact statement can be made, either as to the amount of barren land in the national forests or as to the deduction which should be made for alienations within them. Perhaps one-twentieth would be a fair allowance for the first and one-tenth for the second. It seems improbable that any future action to enlarge the number or size of the national forests in the West will more than offset the eliminations which the recognition of private titles will work.

Thus the nation is likely to have in hand eventually, as the final fruits of the policy of putting into national forests suitable portions of the public lands, from 120,000,000 to 130,000,000 acres of actual forest.

THE DEVELOPMENT OF OUR NATIONAL FOREST POLICY

This policy had its beginnings in the act of March 3, 1891, when Congress empowered the President to "set apart and reserve, in any state or territory having public lands bearing forests, any part of the public lands wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations." Under this act there were created in the next three years reserves which totaled 18,000,000 acres. These reservations, however, were merely withdrawn from settlement and the location of claims; but practically no provision was made for their protection or use. The United States had rather drifted than been guided into the ownership of forest reserves and had little idea what to do with them. Few people knew that there were any such things.

In February, 1896, when the second Cleveland administration was drawing toward its end, the Secretary of the Interior, Hon. Hoke Smith, requested the National Academy of Sciences to make an investigation and report upon "the inauguration of a rational forest policy for the forested lands of the United States." The result was the appointment of a committee of seven, which, after some months of study and examination of western forest conditions, recommended the creation of 11 new reserves, containing in all more than 21,000,000 acres. On February 22, 1897, these reserves were proclaimed by President Cleveland.

The general public was taken wholly

by surprise by this action, which it was ill prepared to understand. It was commonly thought in the West that the effect of the proclamation was to put these lands under the ban of an executive interdict against use, and that they were to be held by the nation as vacant and idle wilderness.

But during the next few months public opinion concerning the reserves underwent a remarkable change. Their true purpose and their real value were recognized. Congress had, by the act of June 4, 1897, helped clear the air by laying down as a guiding policy for the administration of all forest reserves, that they should exist only "to improve and protect the forest within the reservation, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States; but it is not the purpose or intent of these provisions, or of the act providing for such reservations, to authorize the inclusion therein of lands more valuable for the mineral therein, or for agricultural purposes, than for forest purposes." The same act required the Secretary of the Interior to protect the forests against fire and depredations and empowered him to make such regulations for their use and preservation as should be necessary to carry out the objects for which they existed. Thus was definitely formulated the policy which has since guided the executive branch of the government in its administration of the reserves, or national forests, as they are now officially designated.

From that time on the area of the reserves grew apace. President McKinley increased the total from 39,600,000 to 46,000,000 acres. By July, 1904, the total had risen to 63,000,000 acres; by July, 1906, to 107,000,000 acres, and during the last twelve months there have been added 44,000,000 acres more. Thus has been brought substantially to realization the recommendation of the committee of seven, that "all public lands of the United States more valuable for the production of timber than for agriculture or mining shall be withdrawn from sale, settlement, and other disposition and held for the growth and sale of timber."

OUR NATIONAL FORESTS WILL SOON BE SELF-SUPPORTING

In economic usefulness the forests increase their importance almost day by day. Their value to the country is to be measured not by the income which they furnish, but by their contributions to the material welfare of the West; but some idea of the growing use of the national forests may be gained from the fact that receipts from timber sales for the fiscal year 1906-07 were about $600,000, as against less than $250,000 for the preceding year and less than $86,000 for 1904-05. The receipts from grazing, 1906-07, were $875,000. In the year ending June 30, 1904, the national forests yielded a total revenue of $60,000; in the past year, 1906-07, $1,600,000. It is believed that by 1910 the receipts from the national forests will be equal to the appropriations for the forest service.

As years go by it will become increasingly evident that the permanent prosperity of the entire West has been at stake in the forest-reserve question. With the upbuilding of the country through settlement and the rapid rise in the value of timber consequent upon an ever-growing demand, coupled with a fast-dwindling supply, the forested public lands have melted away like snow in spring. In 1905 leadership in the quantity of lumber produced passed for the first time to a Pacific Coast state. The output of the mills of Washington and Oregon now enters the New York market. Within fifteen years the present stand of southern pine will have succumbed to the saw, after which fifteen years more is likely to finish the far western supply. The Lake states have nearly completed their virgin cut, under methods so suicidal that sandy wastes of worthless brush have been substituted for what might have been well-

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stocked young pine forest coming on to take the place of what was cut off.

The situation is so plain now that he who runs—or rides in the Pullman—may read. But had it been necessary to wait until the facts themselves spoke clear to the public understanding, the time for effective action in the West would have passed. Sooner or later the logic of events was bound to point out the right path, but it would have led up to a closed door. There is almost no good timber outside of the national forests which has not passed into private ownership. Would-be locators under the timber and stone act in the far northwest are now hunting down and filing on forty-acre lots—a thing hitherto unheard of. Had the making of reserves been deferred until now, there would be little of value left to reserve.

That the lumber industry, now one of the chief industries of the West, must perish with the exhaustion of the timber supply needs no argument; and private lumbering in the West is making virtually no attempt to prevent exhaustion by the use of methods to secure a future timber crop from cut-over lands. But the economic importance of the forests is far more fundamental than merely the support of the lumber industry, or even the supply of building material, to say nothing of material for the various wood-working industries. Houses can be made of brick, stone, concrete, and iron, but not mine props, nor even railroad ties, with any practical success, as yet, at least. If fire and the ax (or the saw, to be more exact, since the lumberman cannot now usually afford to waste good sawlog material in chips) were allowed to continue their work uncontrolled by government action, future mining development would begin to face an obstacle which would grow increasingly difficult to overcome. It is not too much to say that forest preservation in such regions as the Black Hills and the Montana copper district is of vital moment for the future of the mines. Somes of the great railroad systems of the West are already drawing heavily upon the national forests for ties. The supply of fence-posts for the farmer is a smaller, yet important, function of the for.

THE USE OF THE NATIONAL FORESTS

As yet, however, the use of the national forests as sources of timber supply has hardly begun. In most regions there is still plenty of uncut timber in the hands of private owners. It would be the height of unwisdom for the government to enter into competition with this timber for the market, so long as the public can obtain it at a reasonable price, when a future demand is certain. Undoubtedly the day will come when the necessities of the public will put great pressure upon the national forest administration to sell the timber faster than it will grow, and it remains to be seen whether under these conditions it will be possible to prevent overconsumption. For the present, however, the fact that the national forests are still largely surrounded by more accessible timber belonging to private owners prevents their extensive utilization. In a sense, this involves a loss for the time being of their productive power; for unless mature timber is cut, production is at a standstill, growth merely balancing decay, whereas a well-managed forest is never idle, but always increasing in volume of timber up to the time of harvest. Yet the timber in the national forests is steadily increasing in value, even if not in quantity, from the rise in lumber prices; and this means that its capacity for public usefulness is increasing also.

Essentially the national forests should be thought of as undeveloped property of great potential value, but needing also large expenditures on capital account before their productive power can be fully utilized. Efficient forest management—or, in other words, working a forest for all it is worth—requires, for one thing, good means of transportation. With a well-planned system of permanent roads, logging can be carried on in whatever part of the forest is most ready for it.

Again, protection of the forest against fire and trespass calls for means of getting rapidly about and of intercommunication on the part of the members of the protective force. Rangers' cabins, tools, and other equipment are also matters of necessity. The Forest Service is doing all that it can to make these permanent improvements on the national forests. Roads and trails are being built, telephone lines run, and quarters for the field force provided. The telephone has proved especially effective as an aid in controlling fire. There are now under construction nearly 2,000 miles of telephone lines and 1,800 miles of trail. A special appropriation of $500,000, made by Congress for use in these improvements, enables the work to be pushed. Much of the money paid out by the Forest Service as general expenses should really be classed as expenditure for permanent improvements—in other words, is reinvested. This kind of development is good business, for it is increasing the value and serviceableness of the property. When put into roads, it also helps materially the general development of the region, since the roads are open to the public.

PRESENT CAPITALIZED VALUE OF THE NATIONAL FORESTS

An estimate of the present capital value of the national forests was submitted by the Forester to the Agricultural Committee of Congress last winter. It was as follows:

1. Stumpage value of 330 billion feet of timber at $2 per M..	$660,000,000
2. 110 million acres capable of producing commercial forest, at $1 per acre.....	110,000,000
3. 110 million acres of range for grazing live stock, at 1½ cents per acre (capitalized at 5 per cent).....	30,000,000
4. 83 million acre-feet of water for irrigation purposes, at 10 cents per acre-foot (capitalized at 5 per cent).....	166,000,000
5. Three million horse-power, capable of being developed from water in reserves, at $10 per horse-power (capitalized at 5 per cent).....	600,000,000
6. Estimated value of occupancy and use of reserve land, products, and resources additional to the above.....	5,000,000
7. Permanent improvements now on the reserves (roads, trails, cabins, telephones, etc.)....	5,000,000
Total	$1,576,000,000
Less 10 per cent for private holdings	157,600,000
	$1,418,400,000

This table does not mean that the forests are to be regarded as a corporation would regard a similar piece of property held by it, and run for the sake of the money return. They are maintained and managed not in order to make them yield the largest possible income, but in order to make them contribute most fully to the economic welfare of the public. Uncle Sam has not turned landlord, looking upon his broad acres as primarily revenue-producers and seeking to squeeze out of them all they will bring in. The very moderate charges made for the use of land for grazing, and proposed for the use of land in order to develop and sell hydraulic power, by no means represent the actual value of what the user gets, and gets for an *exclusive* use. The value of the use privilege depends upon the protection which administration by the Forest Service gives, and which is a source of expense to the government. It is a privilege which other users would be glad to pay for. Why should not the beneficiaries of the forests contribute toward the cost of maintaining them?

THE SALE OF GRAZING RIGHTS IN THE FORESTS

At present the receipts from the grazing fee, amounting to $875,000 for the year ending June 30, 1907, constitute the largest single item in the income derived by the government from the national forests. This is because, unlike their use for timber supply, the use of the forests for stock is fully developed. Many re-

gions indeed were overgrazed when the Forest Service first undertook, in 1906, to regulate the grazing and collect the fee. In other regions there is still room for more stock than has applied.

Overgrazing brings deterioration of the range through the injury done the forage plants, which are cropped too close, trampled, or otherwise injured. Naturally its effects are cumulative. By reducing the number of stock allowed on the range, opportunity has been given for recuperation; so that instead of supporting less and less stock, the range is now supporting more than last year. Each herd of cattle or band of sheep is assigned to a particular locality; but the charge is made per head, not per acre, and the number of head allowed is fixed. The result has been to prevent friction between rival stockmen, to give stability to the industry, and to increase the weight and market value of the stock as a result of the improved range conditions. In most of the West the stockmen are glad to accept the measures of regulation and recognize that they are themselves gainers.

If the amount of stock for which grazing permits are sought exceeds the number fixed as the maximum in any one district, first preference is given to settlers, small owners, and those living nearest by. Previous use of the range is also a ground of preference. Thus the first right is given to those who are making homes and helping to develop the country along permanent lines.

From parts of the forests where a young growth of trees is springing up which is valuable for forest renewals, grazing is rigidly excluded. With this limitation and with the prohibition of overgrazing, utilization of the forage crop, which in most of the West abounds within the forest, is safe, wise, and profitable. More than one million cattle and horses and nearly six million sheep and goats were grazed in the forests last season. Through the support which they give to the stock industry, the national forests make one of their largest returns to the economic life of the West.

The Forest Service is now prosecuting investigations to find out how the range may be bettered through modifying the present methods of handling the stock or through introducing new grasses. With forage plants as with trees, man's use without regard to the effect which follows is very apt to produce unfavorable changes in the kinds of plants which reproduce themselves. It is not improbable that by studying and taking advantage of the natural habits of the various species the range within the national forests can be brought to improve itself materially, thus increasing still further its carrying power and value to the West.

THE MOST IMPORTANT PRODUCT OF THE FORESTS

But of the three major products which the forests of the West contribute to man's use—wood, forage, and water—the last is by far the most important.

Upon the mountain slopes of the national forests head the streams which, emerging from the mountains, are diverted into the ranchers' ditches and turn the brown of the desert to vivid green. These mountain slopes should remain forever forested. Once bared, their early-melting snows and summer rains will pour into the rivers like water from a roof. Comparative measurements of stream discharge from forested and unforested basins alike in all other respects have been made in the West by the U. S. Geological Survey. They show sudden floods followed by low water in the former case, a relatively equalized flow in the latter. Neither the West nor the country can afford to suffer the monumental waste which forest denudation would mean.

Many millions of dollars are now invested in national reclamation work. It is recognized that forestry is as necessary to the success of this noble and colossal plan to make fertile the desert as the dams and reservoirs which supplement Nature's storage. When the forests are stripped from the mountains the streams become silt-laden, and the builders of many a costly dam have seen their

Location, Date of Latest Proclamation, and Area of the National Forests in the United States, Alaska, and Porto Rico

State.	Forest.	Date of latest proclamation.	Area.	Total.
			Acres.	
Arizona	Baboquivari	Nov. 5, 1906	126,720	
	Black Mesa	June 30, 1906	2,030,240	
	Chiricahua	Nov. 5, 1906	287,520	
	Dragoon	May 25, 1907	67,200	
	Grand Canyon [1]	Aug. 8, 1906	2,257,920	
	Huachuca	Nov. 6, 1906	314,125	
	Mount Graham	July 22, 1902*	140,880	
	Pinal Mountains	Mar. 20, 1905	45,760	
	Prescott	Oct. 21, 1899	423,680	
	San Francisco Mountains	Apr. 12, 1902	1,975,310	
	Santa Catalina	July 2, 1902	155,520	
	Santa Rita	Apr. 11, 1902	496,100	
	Tonto	Oct. 3, 1905	1,115,200	
	Tumacacori	Nov. 7, 1906	203,550	
				9,422,125
California	Diamond Mountain	Oct. 15, 1906	650,097	
	Inyo	May 25, 1907	214,400	
	Klamath	May 6, 1905	1,896,313	
	Lassen Peak	June 2, 1905	897,115	
	Modoc	Nov. 29, 1904	288,218	
	Monterey	June 25, 1906	335,195	
	Pinnacles	July 18, 1906	14,108	
	Plumas	Mar. 27, 1905	785,620	
	San Bernardino	Feb. 25, 1893*	737,120	
	San Gabriel	Dec. 20, 1892*	555,395	
	San Jacinto	Feb. 14, 1907	1,751,439	
	San Luis Obispo	June 25, 1906	363,350	
	Santa Barbara	Oct. 3, 1906	1,982,100	
	Shasta	Sept. 24, 1906	1,523,770	
	Sierra	July 25, 1905†	5,049,934	
	Stanislaus	Sept. 7, 1906	1,296,800	
	Stony Creek	Feb. 6, 1907	883,405	
	Tahoe [2]	Sept. 17, 1906	1,394,772	
	Trabuco Canyon	Jan. 30, 1899	109,920	
	Trinity	Apr. 26, 1905	1,243,042	
	Warner Mountains	Nov. 29, 1904	306,518	
				22,278,631
Colorado	Battlement Mesa	June 5, 1905	797,720	
	Cochetopah	June 13, 1905	1,133,330	
	Fruita	Feb. 24, 1905	7,680	
	Gunnison	May 12, 1905	901,270	
	Holy Cross	Mar. 1, 1907	1,061,280	
	La Sal [3]	Jan. 25, 1906	29,502	
	Las Animas [4]	Mar. 1, 1907	196,140	
	Leadville	May 12, 1905	1,219,947	
	Medicine Bow [5]	Mar. 2, 1907	1,346,155	
	Montezuma	Mar. 2, 1907	1,612,146	
	Ouray	Feb. 2, 1907	273,175	
	Park Range	Mar. 1, 1907	1,133,686	
	Pikes Peak	May 12, 1905	1,681,667	
	San Isabel	June 12, 1905	321 227	
	San Juan	Mar. 2, 1907	2,203,918	
	Uncompahgre	Mar. 1, 1907	619,428	
Colorado	Wet Mountains	June 12, 1905	239,621	
	White River	May 21, 1904	970,880	
				15,748,772
Idaho	Bear River [6]	May 28, 1906	415,360	
	Bitter Root [7]	May 22, 1905	3,860,960	
	Big Hole [8]	Mar. 1, 1907	304,140	
	Caribou [9]	Jan. 15, 1907	733,000	
	Cabinet [10]	Mar. 2, 1907	494,560	
	Cassia	June 12, 1905	326,160	
	Cœur d'Alene	Nov. 6, 1906	2,331,280	
	Henrys Lake	May 23, 1905	798,720	
	Kootenai [11]	Nov. 5, 1906	165.242	
	Lemhi	Nov. 5, 1906	1,344,800	
	Palouse	Mar. 2, 1907	194.404	
	Payette	June 3, 1905	1,460,960	
	Port Neuf	Mar. 2, 1907	99,508	
	Pocatello	Sept. 5, 1903	49,920	
	Priest River [12]	Mar. 2, 1907	815,100	
	Raft River [13]	Nov. 5, 1906	293,044	
	Salmon River	Nov. 5, 1906	1,879,680	
	Sawtooth	Nov. 6, 1906	3,340.160	
	Weiser	Mar. 2, 1907	1,126,429	
	Yellowstone [14]	Mar. 2, 1907	303,000	
				20,336,427
Kansas	Garden City	July 25, 1905	97,280	97,280
Montana	Big Belt	Mar. 1, 1907	641,460	
	Big Hole [8]	Mar. 1, 1907	1,612,960	
	Bitter Root [7]	May 22, 1905	691,920	
	Cabinet [10]	Mar. 2, 1907	1,566,400	
	Crazy Mountains	Aug. 10, 1906	234,760	
	Elkhorn	May 12, 1905	186,240	
	Ekalaka	Nov. 5, 1906	33,808	
	Gallatin	Mar. 7, 1906	888,660	
	Helena	Apr. 12, 1906	782,160	
	Hell Gate	Sept. 14, 1906	1,582,400	
	Highwood Mountains	Dec. 12, 1903	45,080	
	Kootenai [11]	Nov. 5, 1906	887,360	
	Lewis and Clark	Mar. 2, 1907	5,541,180	
	Little Belt	Feb. 15, 1907	1,053,160	
	Lolo	Nov. 6, 1906	1,211,680	
	Long Pine	Sept. 24, 1906	111,445	
	Little Rockies	Mar. 2, 1907	31,000	
	Madison	Oct. 3, 1905	958,800	
	Missoula	Nov. 6, 1906	194,430	
	Otter	Mar. 2, 1907	590,720	
	Pryor Mountains	Nov. 6, 1906	78,720	
	Snowy Mountains	Nov. 5, 1906	126,080	
	Yellowstone [14]	Mar. 2, 1907	1,352.240	
				20,402,663
Nebraska	Dismal River	Apr. 16, 1902	85.123	
	Niobrara	Apr. 16, 1902	123,779	
	North Platte	Mar. 10, 1906	347,170	
				556,072

Nevada	Charleston	Nov. 5, 1906	149,165		
	Independence	Nov. 5, 1906	135,019		
	Monitor	Apr. 15, 1907	571,000		
	Ruby Mountains	May 3, 1906	423,660		
	Tahoe[2]	Sept. 17, 1906	59,115		
	Toiyabe	Mar. 1, 1907	625,040		
	Toquima	Apr. 15, 1907	386,000		
				2,248,999	
New Mexico	Big Burros	Feb. 6, 1907	161,740		
	Gallinas	Nov. 5, 1906	78,532		
	Gila	July 21, 1905	2,823,900		
	Gaudalupe	Apr. 19, 1907	283,840		
	Jemez	Nov. 7, 1906	1,460,245		
	Lincoln	June 25, 1906	627,136		
	Las Animas[4]	Mar. 1, 1907	480		
	Magdalena	Nov. 5, 1906	153,900		
	Manzano	Nov. 6, 1906	459,726		
	Mount Taylor	Oct. 5, 1906	110,525		
	Pecos River	May 27, 1898*	430,880		
	Peloncillo	Nov. 5, 1906	178,977		
	Sacramento	Apr. 24, 1907	851,840		
	San Mateo	Nov. 5, 1906	424,663		
	Taos	Nov. 7, 1906	233,200		
				8,279,584	
Oklahoma	Wichita[15]	May 29, 1906	60,800		
				60,800	
Oregon	Ashland	Mar. 2, 1907	172,800		
	Blue Mountains	Mar. 2, 1907	3,603,920		
	Bull Run	June 17, 1892	142,080		
	Cascade	Mar. 2, 1907	5,886,840		
	Coquille	Mar. 2, 1907	148,317		
	Fremont	Sept. 17, 1906	1,235,720		
	Goose Lake	Aug. 21, 1906	630,000		
	Heppner	July 18, 1906	292,176		
	Imnaha	Mar. 1, 1907	1,750,240		
	Siskiyou	Mar. 1, 1907	1,132,582		
	Tillamook	Mar. 2, 1907	175,518		
	Umpqua	Mar. 2, 1907	798,400		
	Wenaha[16]	Mar. 1, 1907	494,942		
				16,463,535	
South Dakota	Black Hills[17]	Sept. 19, 1898*†	1,163,160		
	Cave Hills	Mar. 5, 1904	23,360		
	Short Pine	July 22, 1905	19,040		
	Slim Buttes	Mar. 5, 1904	58,160		
				1,263,720	
Utah	Aquarius	Oct. 23, 1903	639,000		
	Bear River[6]	May 28, 1906	267,920		
	Beaver	Jan. 24, 1906	285,930		
	Dixie	Sept. 25, 1905	465,920		
	Fillmore	May 19, 1906	399,600		
	Fish Lake	Jan. 22, 1906	264,320		
	Glenwood	Feb. 6, 1907	173,896		
	Grantsville	May 7, 1904	68,960		
	La Sal[3]	Jan. 25, 1906	128,960		
	Manti	Jan. 18, 1906	785,920		
	Monticello	Feb. 6, 1907	214,270		
	Payson	July 21, 1905	167,280		
	Raft River[13]	Nov. 5, 1906	117,203		
	Salt Lake	May 26, 1904	95,440		
	Sevier	Jan. 17, 1906	710,920		
	Uinta[18]	Oct. 6, 1906	2,187,550		
	Vernon	Apr. 24, 1906	68,800		
	Wasatch	Aug. 16, 1906	85,440		
				7,127,339	
Washington	Colville	Mar. 1, 1907	869,520		
	Olympic	Mar. 2, 1907	1,594,560		
	Priest River[12]	Mar. 2, 1907	406,520		
	Rainier	Mar. 2, 1907	2,565,760		
	Washington	Mar. 2, 1907	6,310,740		
	Wenaha[16]	Mar. 1, 1907	318,400		
				12,065,500	
Wyoming	Big Horn	Dec. 23, 1904	1,151,680		
	Bear Lodge	Mar. 1, 1907	136,784		
	Black Hills[17]	Sept. 19, 1898*†	46,440		
	Caribou[9]	Jan. 15, 1907	7,740		
	Crow Creek	Oct. 10, 1900*	56,320		
	Medicine Bow[5]	Mar. 2, 1907	583,364		
	Sierra Madre	Nov. 5, 1906	370,911		
	Uinta[18]	Oct. 6, 1906	4,596		
	Yellowstone[14]	Mar. 2. 1907	6,662,640		
				9,020,475	
Total of 150 National Forests in the United States				142,972,855	
Alaska	Afognak	Dec. 24, 1892	403,640		
	Alexander Archipelago	Aug. 20, 1902	4,506,240		
				4,909,880	
Porto Rico	Luquillo	Jan. 17, 1903	65,950		
				65,950	
Grand Total of 159 National Forests				150,819,105	

[1] Game preserve created in the Grand Canyon National Forest by proclamation November 28, 1906.
[2] Total of Tahoe in California and Nevada = 1,453,887 acres.
[3] Total of La Sal in Colorado and Utah = 158,462 acres.
[4] Total of Las Animas in Colorado and New Mexico = 196,620 acres.
[5] Total of Medicine Bow in Colorado and Wyoming = 1,929,519 acres.
* Minor modification by Executive order since date listed.
† Minor modification by act of Congress since date listed.
[6] Total of Bear River in Idaho and Utah = 683,280 acres.
[7] Total of Bitter Root in Idaho and Montana = 4,552,880 acres.
[8] Total of Big Hole in Idaho and Montana = 1,917,100 acres.
[9] Total of Caribou in Idaho and Wyoming = 740,740 acres.
[10] Total of Cabinet in Idaho and Montana = 2,060,960 acres.
[11] Total of Kootenai in Idaho and Montana = 1,052,602 acres.
[12] Total of Priest River in Idaho and Washington = 1,221,620 acres.
[13] Total of Raft River in Idaho and Utah = 410,247 acres.
[14] Total of Yellowstone in Idaho, Montana, and Wyoming = 8,317,880 acres.
[15] Game preserve created in the Wichita National Forest by proclamation June 2, 1905.
[16] Total of Wenaha in Oregon and Washington = 813,342 acres.
[17] Total of Black Hills in South Dakota and Wyoming = 1,209,600 acres.
[18] Total of Uinta in Utah and Wyoming = 2,192,146 acres.

artificial lake fill up with worthless mud. The streams of the West are destined to play an important part in the upbuilding of industry and the supply of human needs through utilization as sources of power. This is particularly true in the Pacific Coast states. The Sierra Nevada and Cascade Mountains rise sharply to high altitudes and receive upon their western slopes a heavy rainfall. Thus almost ideal conditions are produced for power development. The streams of the Sierras light the city of Los Angeles, with its 200,000 inhabitants, and operate the electric railways which traverse its streets and spread their network out to the neighboring towns. The water wheels which generate this power and light are located within the national forests. So far as known, California has no good coal. A dense population is certain. The conservation of water power, the coal that does not waste away in the burning, is therefore vitally important.

Since the profits of the corporations which have secured control of these sources of power are large, and since they are users of land in the national forests and benefit by the system of forest protection which the government maintains, there is no apparent reason why they should not be required to contribute something toward the cost of administration. Their case is not comparable with that of the users of water for irrigation, which supports the farmer and home-maker. In no way can a national forest better serve the purpose for which it exists than by increasing the number of farmers and home-makers. Therefore the irrigator need fear no charge.

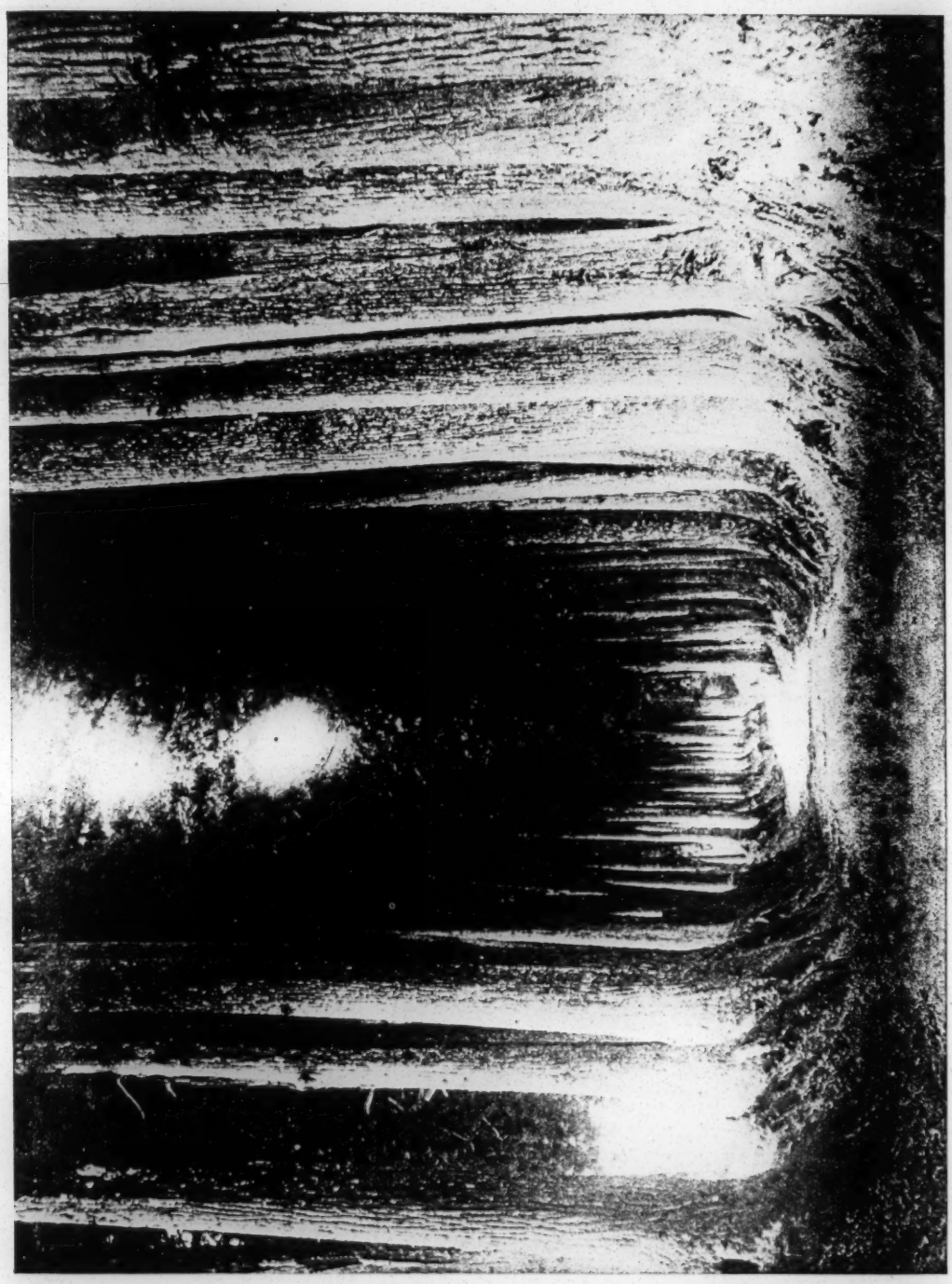
THE FORESTS OF EASTERN UNITED STATES ARE UNPROTECTED

As the years pass, the use of the national forests will constantly increase, and with this will increase also the recognition among the people of the entire country that saving the forests of the West though government ownership has been one of the greatest achievements of the present generation. This important work of constructive statesmanship has been participated in by presidents of both political parties and has proceeded along the lines laid down by Congress. It has brought us, and will in the future still more bring us, to realize that government action to secure the conservation of great natural resources which are threatened with wasteful dissipation is demanded in the public interest.

It still remains for us to work out some method for saving the forests of those parts of the East where essentially the same problem is presented as was met in the West. Since in the East there are no public lands belonging to the United States, a different method will have to be followed. To a large extent the problem is one which calls for action by the individual states.

Eventually it will be necessary in this country, as it has been necessary in Europe, for the states or the nation to own and manage a large part of the timber lands. Forestry received its first stimulus in Europe when it was perceived that in consequence of forest destruction the country was threatened with a dearth of fuel. The development of railway transportation, which made possible the general use of coal, came in the nick of time to avert this evil.

Meanwhile landowners had taken up the growing of timber extensively, and there is now a sufficient acreage of forest, public and private together, to produce each year as much wood as France consumes. But it has been found that the private owner does not care, and indeed cannot afford, to grow the larger sizes of timber. As compound interest rolls up against the original investment, the time comes when the yearly increment of wood ceases to add a value equal to the loss by the failure to realize. Private owners therefore manage their lands on short rotation periods. The result is that for some years in France, and other European countries as well, a scant supply of construction material must be faced. In no country does private forestry give any promise of being able to

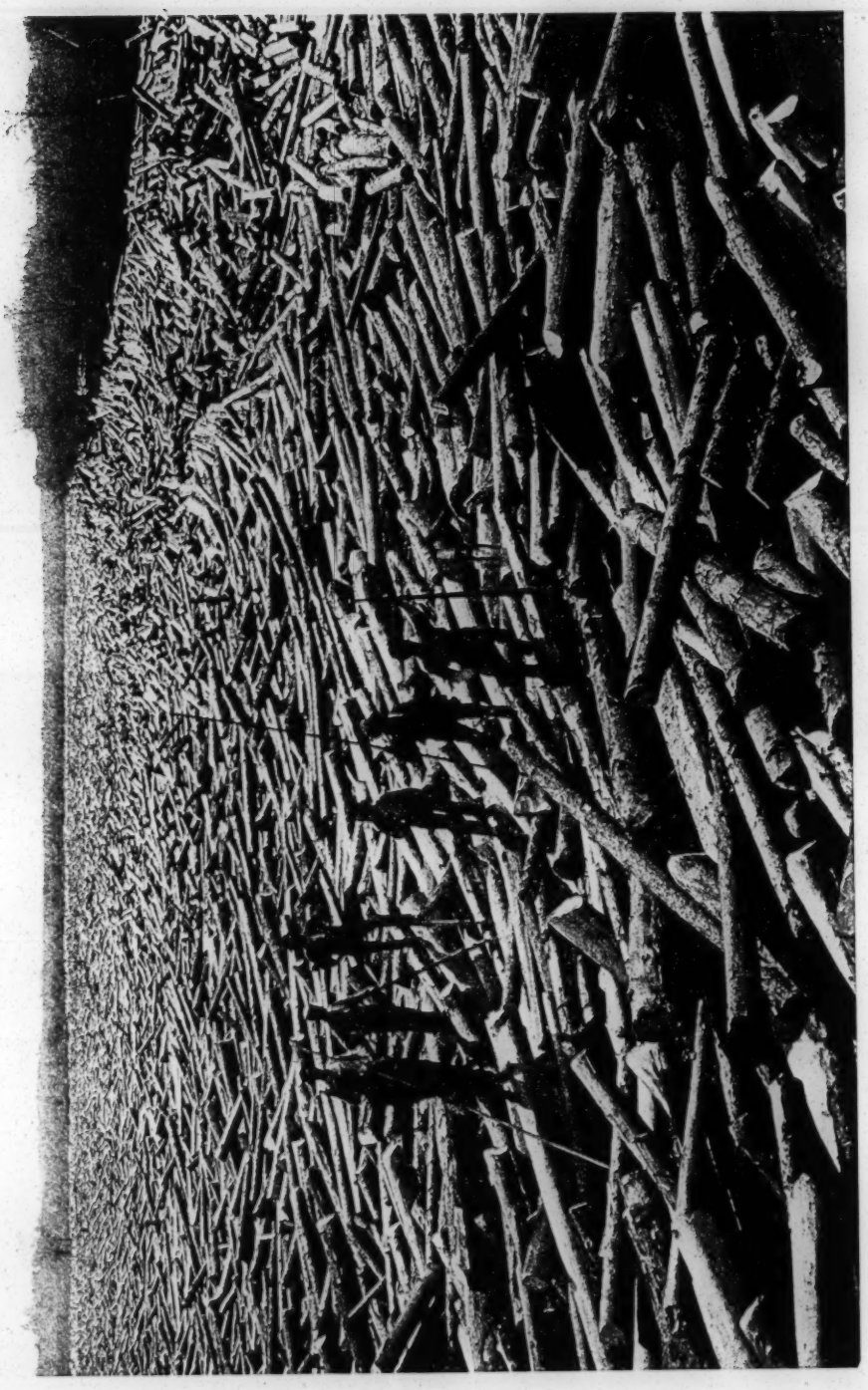


Cryptomeria Japonica

The avenue is fifty miles long and several hundred years old. Nikko, Japan

Photo from U. S. Forest Service

One-half of a Redwood Tree on the Way from the Forest to the Mill—Humboldt County, California



The Glens Falls Boom, Glens Falls, New York

Photo from U. S. Forest Service

supply the public need. The state, with its lower interest rate and freedom from taxes, can do what the private person cannot.

Three-fourths of the population of the United States is found east of the Mississippi River, but over half the timber is now west of it. Yet it is still from the forests of the East that the larger part of our timber is being drawn. Less than two decades will leave the East practically without saw timber of her own, unless it is possible to draw more heavily than present conditions permit upon the supplies of other regions. The demands even now laid by the lumber traffic upon the transcontinental lines from the Northwest have severely taxed their carrying powers. A very serious situation is in prospect.

Again, the East is the home of the hardwoods, or broad-leaved trees. These are used extensively in wood-working industries of many kinds. In these industries large amounts of capital are invested, and their products furnish a surprisingly large number of articles of daily use. Our virgin hardwood forests are so nearly cleared away that the collapse of the industries which they support is imminent.

There is every reason why what has happened in the mountains of the West should happen also in the mountains of the East. In the West, forests are needed to furnish wood and keep the streams running. In the East they are needed to furnish wood and keep back flood waters.

In certain regions, as in parts of the Southern Appalachians and in the White Mountains, the most serious effects of forest destruction fall mainly upon other states than those in which the destruction takes place. It is clearly too much to expect that Tennessee or New Hampshire should maintain forests to prevent floods, loss of water power, and impairment of navigation in Georgia or Massachusetts. In such cases purchase of lands by the federal government would seem to be the proper remedy. It is to be hoped that we shall soon see national forests created in these two important regions.

FLASHLIGHTS FROM THE JUNGLE

A few notes and illustrations from a remarkable book by C. G. Schillings, published by Doubleday, Page & Co., giving a record of hunting adventures and of studies in wild life in Equatorial East Africa.

MR C. G. SCHILLINGS is a wealthy young German who some years ago set out to photograph the big game of Equatorial East Africa. As a result of 10 years almost entirely devoted to the work, he has obtained and published the most wonderful series of photographs of the great animals of Africa in their native haunts that the world has seen. What makes his illustrations particularly valuable is the fact that they are of living animals and not of dead game, and that they are furthermore accompanied by an intelligent and keen description of the habits and characteristics of the beasts.

Mr Schillings greatly deplores the useless sacrifice of such a large number of magnificent elephants, lions, giraffes, rhinoceroses, etc., of Equatorial East Africa. In a few years this region, so recently the richest game country in the world, will be as depleted as South Africa or the United States.

The author gives many illustrations of the rapidity with which the big game is being swept away. In 1896, when he first went to that region, countless numbers of wild elephants roamed the forests and plains; today they are counted in tens where formerly they were counted by thousands.

XUM

A Great Bull Eland

Mr Schillings refers to the case of the late Dr Kolb, a German who came out to British East Africa in connection with a Utopian undertaking called "Freeland," and who, when his political scheme became impossible, applied himself to the reckless slaughter of the big game of British Africa. "In the course of two or three years he had slain, for no useful purpose whatever, one hundred and fifty rhinoceroses (a companion killed one hundred and forty more), each one being a far more interesting mammal than himself. At the end of this career of slaughter a rhinoceros killed him—perhaps appropriately."

The same is true of the giraffes, the lions, and practically all the larger animals.

He emphasizes the fact, however, that this extermination is wrought not so much by the sportsman as by the trader, and especially by large numbers of Africans who have been given guns and ammunition.

"I maintained rigorously the principle of keeping my caravan (in which I had never less than 130 men) upon a vegetable diet for the most part, allowing them meat only to a very small extent, and then merely as an adjunct to their meals. In the famine year of 1899 my provisions cost me more than 20,000 marks, which might have been brought down to a trifling sum had I taken heavier toll of the game, as the natives were always ready to barter vegetables for animals I had killed."

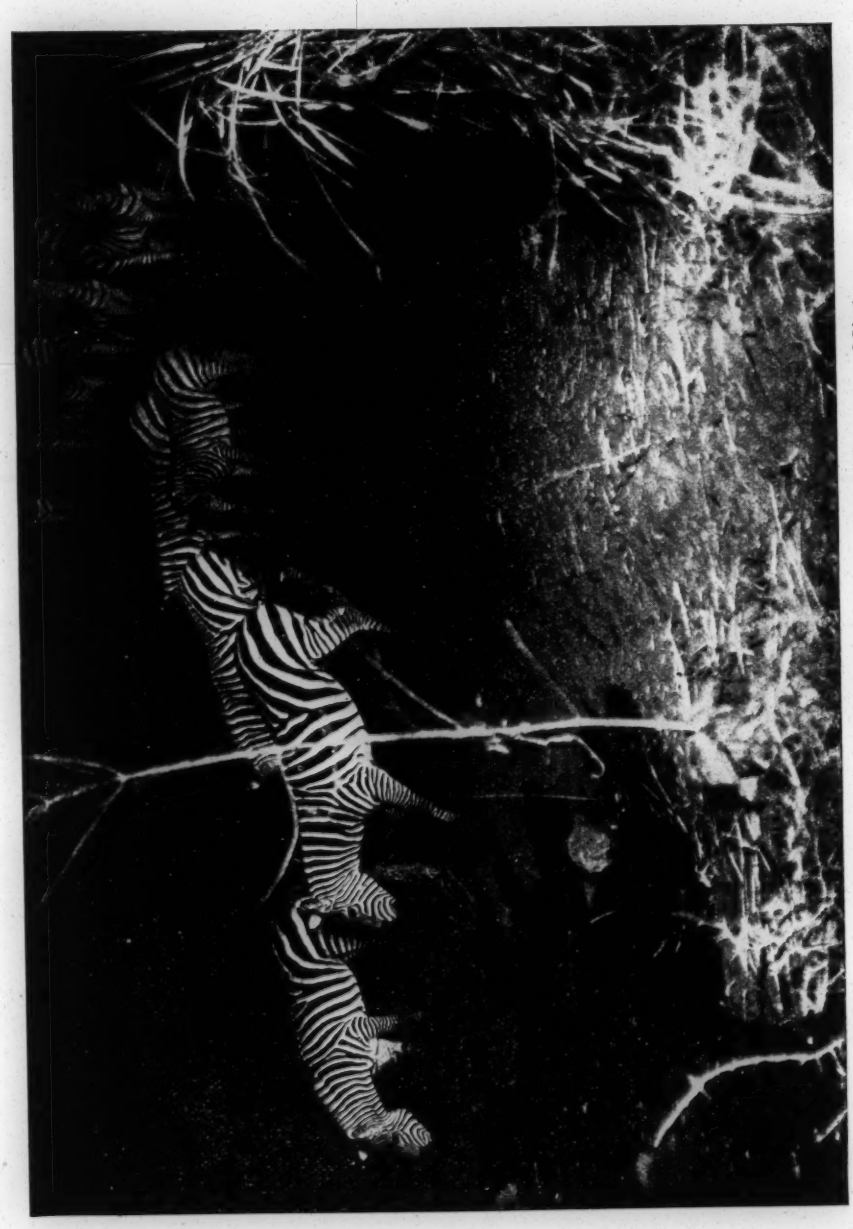
When the reader remembers that all expenses of Mr Schillings' expeditions were paid for out of his private means, this action on his part appears all the more commendable. He shot many animals, but brought home his specimens—40 lions, 35 leopards, large numbers of hyenas, jackals, and other beasts of prey, and many birds.

One can form no notion from seeing a stuffed giraffe or rhinoceros in a museum of the immense difficulties involved in the securing and preparing of such a specimen. When the animal has been shot and its skin carefully prepared, all the fat removed from it and every precaution taken against flaws, the skull and bones also having been cleaned separately, the collector has still to take immense pains about the transport to Europe. The weighty burden has to be carried on men's shoulders to the coast, along dangerous tracks, often through marshes and almost pathless thickets, and across streams and rivers. The ravages of insects and the damp atmosphere have to be fought against. There are long weeks of anxiety before the goal is reached.

All this trouble, to say nothing of the considerable expense, is involved in the bringing home in good condition of a single such specimen; but Mr Schillings has brought home quite a number of

Two Very Large Bull Elephants in a Virgin Forest to the West of Kilimanjaro

Their tusks weighed about 80 kilos apiece. This photograph was taken from a hill at a distance of about 300 paces, and should be held at arm's length. This series of pictures are by C. G. Schillings, and are republished from his book, "Flashlights from the Jungle," through the courtesy of Messrs Doubleday, Page & Co.



A Flashlight Photograph of Zebras Drinking at Night

Exceedingly difficult animals to photograph, owing to their excessive timidity and wariness

Some Specimens of Schillings' Giraffe in the Mimosa Woods

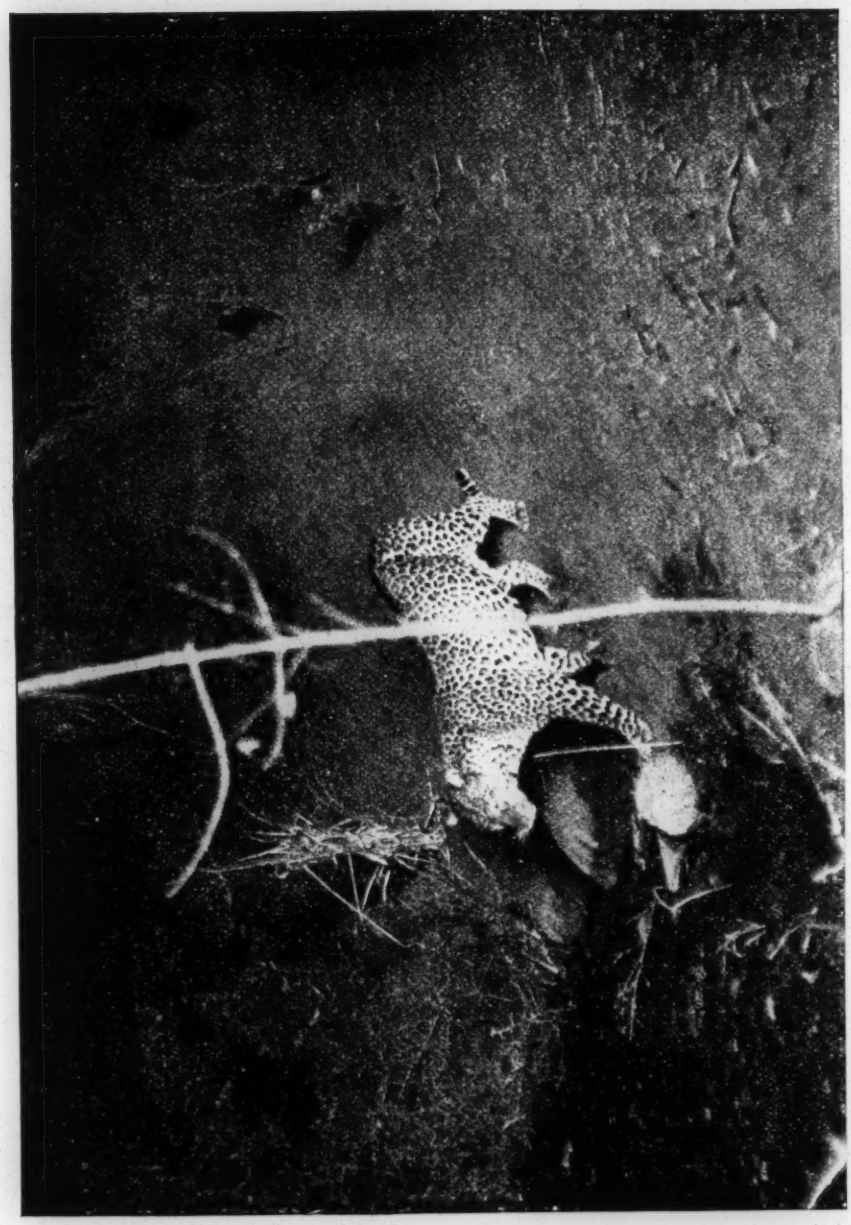
This is a new species discovered by Mr Schillings

A Herd of Zebras and Gnus

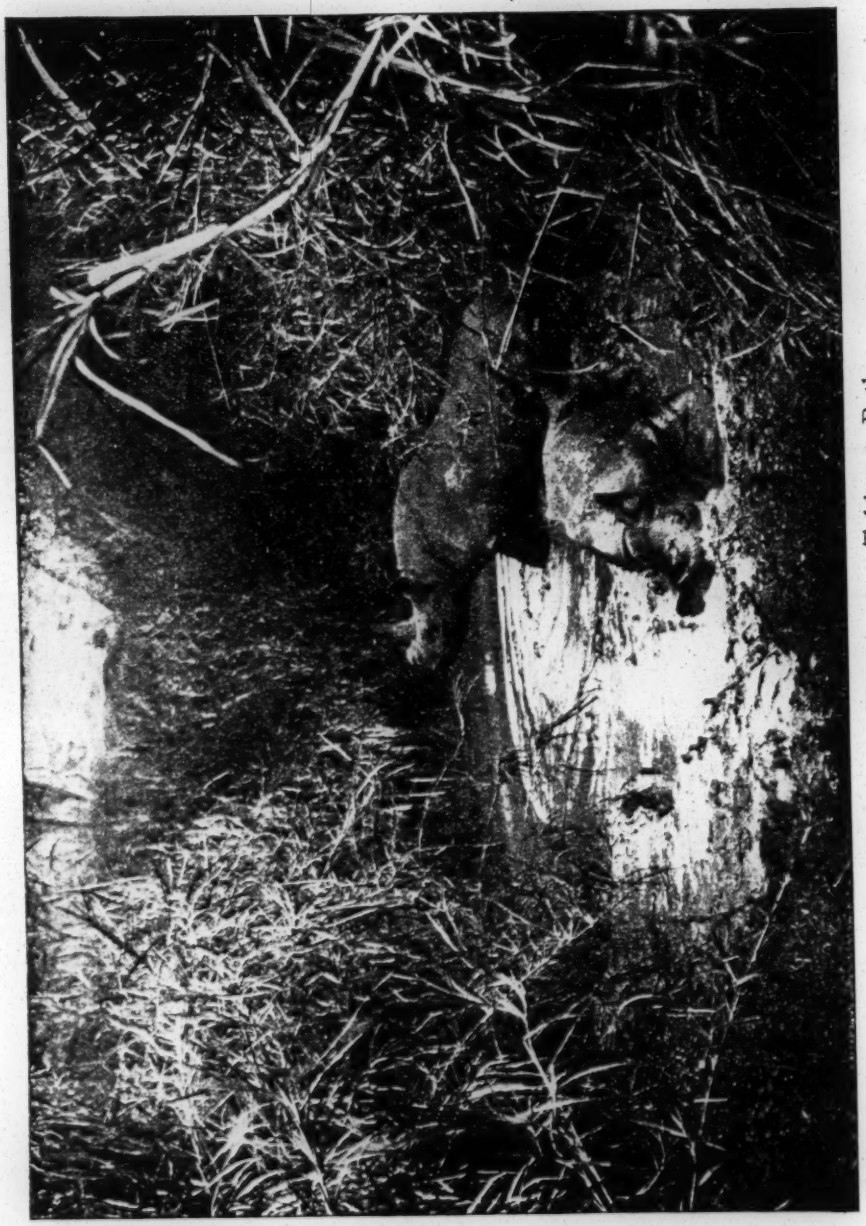
Gnus were to be seen in thousands roaming over the velt, while herds of a hundred zebras were not unusual

Schillings' Giraffe Passing the Hiding-place from which the Picture was Taken

There is nothing attractive about a giraffe in captivity, owing to his gaunt skeleton appearance, due to lack of proper nourishment, but in the forest he is stately and handsome



A Flashlight of a Powerful and Full-grown Leopard, Taken at Midnight



Two Great Rhinoceroses Taking a Bath

A Cow Rhinoceros with its Young

Photographed by flashlight a few yards from the camera

Flashlight of a Maned Lion

Flashlight of a Lioness About to Spring upon a Donkey

giraffes, buffaloes, rhinoceroses, and elephants, a great number of large antelopes, and hundreds of hides and skins and skeletons of every description, all of them in such good condition that they are suitable for exhibition in museums.

"For days together I occupied myself exclusively with photography, getting any number of pictures and so managing that hundreds and hundreds of gnus and zebras hung around my camp almost like tame deer. Here they grazed, along with flocks of the beautiful crested cranes and Egyptian geese. Hundreds of Thomson's gazelle grazed like sheep among them, and wherever the eye turned it saw the rough, dark, strongly marked forms of the old gnu bulls as they grazed apart, cut off from the herds."

The chapter entitled "The Minds of Animals" contains some interesting observations. A young rhinoceros which the author captured and forwarded to Berlin "attached himself to me in a very few weeks, and got to distinguish quite clearly between the large number of men who came into touch with him, bearing himself quite differently with different individuals, just as he still singles me out from all the thousands who approach him now in the gardens in Berlin."

"Many other animals in this distant black country were to us a real source of enjoyment and consolation. Take, for example, my young elephant, who loved me with childlike simplicity, till I unfortunately lost him for want of a foster-mother; also my tame baboon, who used to be almost mad with joy when he saw me, a mere speck on the horizon, returning to the camp from one of my excursions—his sight is infinitely keener than ours.

"From earliest times we have heard tell of an unusually wise bird that our ancestors nicknamed the 'philosopher.' This is the marabou-stork, specimens of which I have come across whose wisdom and fondness for human companionship would scarcely be credited.

"Storks and marabous, which perhaps have lived a man's lifetime or more in the distant velt, have attached themselves to me in the friendliest manner, albeit caught after many difficulties and by strategy. A specimen, well on in years, which I brought with me to Berlin still singles me out from all the other visitors by peculiar marks of affection.

"Of course it means a hard struggle, and it is not easy to win the friendship of such old and peculiarly obstinate birds. For weeks and months one must feed them by force with pieces of meat before they make up their minds to feed themselves. One must tend them oneself, wait on them constantly, and occupy oneself with their needs. Then one day, quite suddenly, all mistrust and fear are overcome, and one is repaid a thousandfold for all one's trouble by making a genuine friend of the bird.

"It must be remembered that I am not speaking of young birds reared by men from infancy, but of birds caught perhaps at the age of thirty or forty years or even older; for marabous attain a very great age, like large ravens or vultures, one of which lived in captivity, under favorable conditions, for a hundred years. My marabous moved about in the camp free and unrestrained. They built their nests, and did not try to fly away. They greeted me on my return with joyful cacklings; they planted themselves close to my tent as sentinels, and caressed me with their powerful and dangerous bills. For a long time my black cook had taken on the duty of feeding them, and their affection for me was not at all the result of my giving them dainties, but of my just and intelligent conception of their habits."

The glories and wonders of the velt are thus vividly portrayed:

"In the Nyika one constantly comes across large white-ant heaps, several feet high and of considerable width. During the night the tiny builders are untiringly active in raising and building their fortresses, which are very strongly put together. At the approach of the rainy season the ants, which by this time are winged, arise from the ground in swarms

to set out on their long wedding journey in the air, to lay the foundations of new colonies elsewhere. Most of them know perfectly how to use their little white pinions, although it is the first and only time in their lives that they rise from the dark depths of the ground in the damp evening atmosphere.

"Here and there the steppes are adorned with the well-known monkey-bread tree (*Adansonia digitate*). Covered with a shining bright gray bark, this tree often attains a circumference of many yards, and, in spite of its grotesqueness, charms us with its primeval appearance. The traveler soon learns to value it, for often rich stores of water lie hidden in the hollow trunk—stores that have been supplied by the rainy season—which may be the only water to be found in the district for several days' journey.

"It appears that the lioness is always the aggressive party. The pictures give only single lions, but in reality there were several others in close proximity. They had gradually surrounded their prey and approached it from different sides.

"There may seem to be something gruesome about sacrificing oxen and donkeys in this way; but they would otherwise fall victims probably to the tsetse fly, a horribly painful death, whereas lions kill very quickly and surely; they just give one bite in the neck, and do not torture their prey. I can vouch for this myself from having witnessed the sight repeatedly from my thorny hiding-place. Death was instantaneous in every case; and so stealthily does the lion creep up to its prey that it is only at the last moment that the latter tries to break away.

"Deep stillness lies over the velt, in the dark night; a gentle rustling is heard now and again in the thick foliage and branches. Suddenly a roaring, mighty something strikes the ear and a heavy thud follows, as the prey is captured. There are never more than a few scratches to be found on the booty; a crunching bite in the neck is always the cause of death. Many men killed in this manner have never even uttered a cry."

An attack from a rhinoceros, Mr Schillings says, is more to be dreaded than that of any other animal. In spite of its huge bulk, it is very agile, nearly always succeeding in ripping its enemy to pieces on its long horn.

"In addition to noting the direction of the wind when stalking a rhinoceros, you have to look carefully to see whether the rhinoceros has his feathered satellites, the rhinoceros-birds (*Buphaga erythrorhyncha*), on him or not. When resting, he often resigns himself to the care of these small feathered friends of his, which not merely free him from parasites, but which, by a sudden outburst of twittering and a clattering of their wings, warn him of impending danger. Thus put on the alert, he rises up quickly and assumes his well-known sitting position, ready to take to flight if need be, but lying down again if there seems to him to be no enemy near.

"If the hunter is favored by the wind and able to conceal himself after this first alarm, and the rhinoceros lies down again, the birds, varying in number from a very few to a couple of dozen, settle down again upon his hospitable body. But the moment they become aware of your near approach they leave it again, arousing the animal once more. It is a case of a partnership between an animal with a very keen sense of smell and birds with very keen eyes.

"Zebras, leopards, and giraffes are so strikingly colored that one would expect to find them conspicuous figures in their own haunts. But, as I have already remarked, these three kinds of animals have really a special protection in their coloring. It harmonizes so perfectly with their surroundings that they are blended in the background, so to speak, and can easily be overlooked. It must be explained that one does not often see the animals close at hand. In certain lights, indeed, according to the position of the sun, zebras, leopards, and giraffes are so merged in the harmony of their surroundings that even when they are quite near, the eye of man can easily be de-

ceived. It is not only in the very dry season, when the plant world stretches out before us in every hue from dirty brown to bright gold, that the giraffe harmonizes with its surroundings in this way; you sometimes cannot distinguish its outline when backed by the green boughs of the trees in the shade.

"The coloring of giraffes varies very much, even in the same herd. I have seen herds of forty-five or more heads, and from close quarters I have ascertained that some were striped quite darkly and some very lightly. All bulls are colored more or less darkly.

"Giraffes dwell chiefly on the plains. About seven-tenths of German East Africa represent an El Dorado for giraffes. Here they find all the conditions of life necessary to them. They can travel a long way from water, as they can do without it for several days at a time. During the rains they get as much water as they want from the moist leaves. Their food consists chiefly of foliage and of the thin branches of the different acacia trees, as well as the leaves and twigs of many other trees.

"When in flight a herd clatters away in straight lines, the whole unwieldy body swings backward and forward, the neck swaying like a mast on a moving sea and the tail swinging to and fro. When outlined against the bare horizon, its appearance is grotesque, not unlike that of a bare tree. Even at a distance, one notes the extraordinarily expressive eyes. I have never heard it utter a sound of any kind: it appears to be absolutely dumb. The fearful blow it can give with its long legs will hold even a lion in check.

"The zebra is a polygamous animal, and the jealousy with which the males watch over their harems often results in bloody encounters. They are very malicious beasts. Indeed lions and tigers are far safer to handle than the zebra, with his fearful bite. They make a peculiar dog-like barking noise when in flight.

"None of the attempts to subjugate them as beasts of burden have met with success—a fact much to be regretted, in view of the rapidity with which horses succumb to the tsetse fly. The problem of transportation in East Africa is therefore far from settled."

Mr Schillings in his introduction gives credit to several English and German sportsmen who had preceded him in hunting wild game with the camera, but he makes no mention of Hon. George Shiras, 3rd, of Pittsburg, who was by many years the first to picture instead of kill the beasts of the forest and plain. The methods and ingenious flashlight apparatus which Mr Shiras invented in the eighties and early nineties have been employed by every camera sportsman since, and were those used by Mr Schillings so successfully in German East Africa. Some of Mr Shiras' photographs were exhibited at the Paris Exposition in 1900, where they were awarded a gold medal, and again at Saint Louis in 1904, where they again received the highest award. About 75 of Mr Shiras' photographs were published in the NATIONAL GEOGRAPHIC MAGAZINE in July, 1906.

SAINT STEPHEN'S FETE IN BUDAPEST

BY DE WITT CLINTON FALLS

MEMBER OF THE NATIONAL GEOGRAPHIC SOCIETY

"FIVE o'clock! Five o'clock!" called the night porter of the Grand Hotel Hungaria, as he knocked on the doors of the different guests' rooms. It roused them from their beds, but not from their slumbers, for that peaceful state had been rudely broken into two hours before by the ringing of every church bell in this twin city of the Danube. It was a beau-

Street Scenes During Saint Stephen's Fete—Budapest

tiful morning, the 20th of August, and the occasion of this early demonstration was to welcome in the day of the greatest of Hungary's annual festivals. In these days of the rapid modernizing of the more traveled countries of Europe, the old-fashioned festivals, religious fêtes, national costumes, and customs are fast disappearing, and there remains no more novel and entertaining sights than those surrounding the ancient fête of Saint Stephen of Hungary.

For who Saint Stephen was and why he was thus honored we must go back some nine hundred and odd years in Hungarian history, from which we gather the following information: Vaik came to the throne of the Magyar Duchy in the year 997. He applied for and received the title of Apostolic King from Pope Sylvester II, and was crowned in Budapest in the year 1000, under the Christian name of Stephen. He did much for his countrymen to bring them into the established church, and founded throughout his kingdom churches, schools, and convents. His administration was a wise one, and so firmly did he deal with the attempted uprising of the "Old Magyar Religion" party that when his death occurred, in 1036, he left his country entirely converted to Christianity. So much had he done for the advancement of the Christian faith among the wild hordes of eastern Europe, and added to the civilization of his subjects, that he was canonized and gladly proclaimed by the Hungarians as their patron saint.

When the Saint passed away, in 1036, one of his hands was amputated and embalmed, and this sacred relic reposes in the court chapel of the Royal Palace in old Buda. Adorned with many handsome rings, it is kept in a crystal casket, set in a beautiful golden reliquary ornamented with many precious stones. In a special shrine behind the high altar, it remains for 364 days in every year, where it can only be seen by the royal household and those having special permission. On the three hundred and sixty-fifth day, the one set apart to do honor to Saint Stephen, it is taken from its resting place, and with great pomp and a most brilliant escort is carried in a procession to the old Matthias Church for a special memorial service. This is the only time that the reliquary is visible to the peasants and the people of the humbler classes, and they come from all over Hungary on that day to do homage to the sacred relic, as it is carried through the streets.

A QUAINT OLD CITY

Budapest has many attractive features that make it in itself one of the very interesting cities of Europe. Here are combined the old and the new world in startling contrast. This twin city is divided by the rapidly flowing Danube, and old Buda, with its ancient fortress, palace, and antiquated buildings, looks across at its most modern sister, Pest. In the old city the streets are narrow and crooked, lined with low and quaint houses. There still clings to it in many places an oriental look, left by the Turks, whose occupation lasted more than two hundred years. In Pest (to which Buda is joined by several handsome bridges) all is different, and in many ways this is one of the most up-to-date of continental cities.

It was in this latter city that the first signs of the approaching festival began on August 19. All during the early morning of that day market wagons had been coming in, laden with supplies of provisions for the expected crowds of visitors, and the market by noon was a study of life and color rarely seen in western Europe. The market building is new and modern in all its appointments. Here you see the farmers and their wives, from the neighboring country, who have driven in with their wagon-loads of produce. This they unloaded in places assigned to them by the police, for everything is conducted with splendid system. The women, to whom the sales seem to be entirely entrusted, vie with each other in making

the best display possible of their wares, and some of the arrangements of vegetables and fruits were exceedingly attractive. This being a market for a holiday crowd, there was a large quantity of the latter, and one was particularly struck by the enormous number of watermelons—there seemed enough to supply all Europe, but none too many, we discovered, for the throngs of merry-makers, who equal our own Southern pickaninnies in their love for this luscious fruit. The farmer's work seems over when the contents of the wagons are unloaded, and he lolls about, smoking his cigarette, or goes for a long glass of native wine in one of the many little cafés. He is rather a picturesque fellow, even in his every-day clothes. He still clings to the national costume, with its flat black hat, wide white trousers (so full that they look almost like a divided skirt), and high-heeled knee boots. Should the day be warm he is sure to remove his short, and sometimes braided, coat, but never lays it aside. He slings it over one shoulder in a manner we are apt to associate with the dashing officers and men of the picturesque hussar regiments. The women wear short skirts of rough material and generally boots similar to the men. Fancy handkerchiefs are sure to be tied over their heads, which makes many bright spots of color among the piles of green vegetables.

OBLIGING POLICE

All day Saturday people came streaming into the city, and by evening the scene was full of gaiety, color, and life. The streets were crowded, and the beautifully lighted cafés were jammed to the doors, and out of doors as well. To accommodate the extra patrons, tables had been placed not only on the sidewalks, but quite across the roadways in some places, the police obligingly closing that portion of the street from traffic. These tables were attractively arranged, lit with little colored lights, and, as the night was warm, seemed more popular than those indoors.

Fancy our famous traffic squad shutting off Thirty-third Street, that the Waldorf-Astoria might accommodate its extra patrons at overflow tables placed outside on the asphalt! But in Budapest this was a people's festival; so busses, cabs, and wagons willingly took another street, that the city's guests might be accommodated and made comfortable and happy. All the hotels were quite full, and many peasants seemed contended to wander about the streets all night, catching a nap where they could, on park bench or doorstep. Their sleep, or in fact the sleep of the entire population, was not to be a late one, for at the first sign of dawn the bells began a great variety of sounds—from the deep boom of those of the cathedral to the sharp tinkle of the small bell of some little chapel. Every church seemed supplied with them, and the ringers seemed to be particularly active on this August morning. If the bells were not enough to arouse one, there were plenty of other sounds; for no sooner had the sun appeared than the streets became full of tramping, talking, shouting crowds; and now and then came the roll of drums or the music of a military band, as detachments of troops marched to the scene of the festival. All were moving in one direction, across the bridges and up the winding, narrow streets of Buda, to the plateau on which the Royal Palace and the Matthias Church are situated.

THE BRIGHT COSTUMES OF THE PEASANTS

The procession was to start at seven, and at least an hour before that time our carriage was at the door and we were off to our position in the Palace Square. The first thing that attracted our attention, as we drove by the walking crowds, was the change of costume of the peasants from the day before. Then all were in their working clothes, but today they are arrayed in all their glory. The men had retained their flat hats, but had generally adorned them with flying ribbons of the national colors—red, white, and green. The white divided-skirt-like

Hungarian Peasant

Hungarian Nobleman

Views of the Procession

trousers were now ornamented on the bottoms of the legs with fringe, or coarse lace, and the dark working coats had been laid aside. In their place were gala ones, always colored—soft browns, reds, and greens—and elaborately braided with different-colored cords. As the day was warm, these were generally worn slung over the shoulders, giving the owners a chance to display their tastes in waistcoats; and in many cases a gaudy taste it was.

The women retained the colored head-handkerchiefs, but they were newer and brighter than those worn on Saturday. Their waists were generally of white or light cotton material, sometimes gaily ornamented with coarse colored embroidery. It was the skirts that were the most unique things about the costumes. Of the brightest colors, they were accordion-plaited, and stood out in the most remarkable manner. How they accomplished this was a mystery to the ladies of our party, until our trusty guide and interpreter had been interviewed. From him it was learned that no Hungarian peasant woman considers herself properly dressed for a gala occasion unless she has on at least twenty petticoats!

Though this made the dress hang out in an attractive manner at the bottom of the skirt, the effect at the waist-line was sometimes startling. We were struck by the beautiful tones of some of the colors worn. This was accounted for by our guide, who told us that these outer skirts (which are only worn on the grandest occasions) were sometimes very old, having been passed down from one generation to another as wedding gifts. The dresses are all quite short, and if the boots of every-day wear had been laid aside, there was sure to be an elaborate display of hosiery. Though some were contended with plain but bright colors, the general taste ran to stripes, and particularly smart seemed those that ran horizontally. The children of both sexes were but miniature counterparts of their parents.

As we entered the streets through which the procession was to pass, we found them lined with troops. They were the men of the Hungarian infantry, their skin-tight trousers laced inside their shoes, and each soldier with three green oak leaves stuck in his shako, in honor of the day.

THE OLD FAMILIES OF HUNGARY HAVE EACH ITS PARTICULAR COSTUME

On arriving at the Palace Square the scene was an animated one. We had been so fortunate as to secure a permit for our carriage to remain there, so that we had a fine point of vantage for our observations. The procession was forming in the inner court of the palace, and through the high, arched gateway a stream of those who were to take part were wending their way. There would be some high church dignitary, humbly walking, arrayed in the beautiful vestments of his clerical rank and attended by acolytes in scarlet and white. Then some nobleman, dressed in the national costume, dashes by in his carriage; for none are of too high rank to do homage to Saint Stephen on this particular day. The costumes of these gentlemen of rank and title were without doubt the most picturesque feature of the whole procession.

The old families of Hungary have each its particular costume, conforming in a general way to the national dress, but with special decorations that make it possible for those familiar with them to tell at once to which family the wearer belongs. The costumes are most elaborate, generally of velvet heavily braided, and ornamented with trimmings of fur, cords of gold and silver, and cut steel or jeweled buttons. With these are worn richly ornamented swords, high boots, heavily spurred, and caps of fur or velvet surmounted by eagle feathers or aigrettes. These are held in place by clasps of curiously wrought gold or silver, sometimes set with precious stones. Let one of these dresses be of red or light green velvet, trimmed with Russian sable, with further addition to the above-mentioned ornaments of numerous orders and decorations, and a Hungarian nobleman of high rank is a picture that it is difficult to equal unless to go to the Eastern home of the gorgeous oriental.

No gentleman of quality in Hungary attends a ceremony of state unless accompanied by a chasseur in the uniform of the retainers of his family. These servants sit on the box with the drivers and are but a trifle less gorgeous than the masters themselves. The general appearance of these costumes were of a military nature, and the style affected that of a hussar cut—tight breeches, short jackets, with an extra coat slung over one shoulder. All were of bright-colored cloth, heavily braided in gold or silver, with an enormous number of buttons in metal to match. Fur hats topped with a single eagle's feather or plume, boots sometimes of red or yellow leather, and a large curved sword completed their outfit; and with their gorgeously arrayed masters they made a brilliant picture, as carriage after carriage drove into the Palace Court.

The Sacred Relic

The Procession

THE PROCESSION

By this time people thronged the square as well as the street leading to it, down which the procession was to pass. It was not a curious, sight-seeing crowd, noisy and pushing, as would have been the case had the coming pageant been of a political or military nature. This was a religious ceremony they were about to witness—one of great solemnity, and to see which some had come many miles. Money had been saved for years for the trip, and possibly it was the one time in their lives that numbers of the peasants were able to make the journey. The police and troops had no difficulty in keeping the roadway clear, the people remaining respectfully behind the lines, many with bowed heads, in prayer or in telling the beads of their rosaries.

At seven promptly the procession emerged from the Palace gateway. It was headed by several hundred children, the girls dressed in white, chanting as they walked along, and carrying many banners on which religious subjects were portrayed. The banners were a feature of the entire procession, as there was a great number of them throughout the line, some very beautiful. Those carried by the children were small and plain, with a picture of a saint on a simple background of some colored material. Later they became more elaborate, and those carried immediately in front of the reliquary were of the most splendid colored brocaded silk, the pictures being magnificent examples of hand embroidery. Behind the children were many religious societies, of both men and women, some wearing special regalias. These also were chanting or repeating prayers in concert, generally led by a priest in full vestments. A battalion of infantry formed the guard of honor and was preceded by a full regimental band. They marched with slow, measured step, the music being of a solemn and churchly nature. Immediately following the military came the priests from the different churches of the two cities, attended by their assistants and acolytes, all in their highest robes and vestments.

The dropping on the knees of many of the spectators and the bowing of heads and crossing of themselves by others announced the approach of the reliquary. Preceded by magnificent banners and by the Archbishop of Budapest, it was borne high in air, so that all might see. It stood on a carved framework, which was elaborately covered with gilding and embroidery, and was carried on the shoulders of four richly robed priests. On each side walked two royal heralds, who represented the King as special guardians of the relic. They were magnificent persons, in crimson velvet, bearing the royal arms of Hungary embroidered in gold on their chests and backs and carrying golden staffs of office richly ornamented. A special guard of honor marched in single file on the outer edge of the immediate escort of the reliquary. This was composed of a detachment of the celebrated Hungarian Palace Guard, the most theatrically dressed troops in all Europe. Their uniforms were a queer combination of past and present. A polished steel helmet of ancient pattern, crowned by a single eagle's feather, surmounted a most modern-cut scarlet uniform, richly braided with silver cord. Their boots were of brilliant yellow leather, and for arms they carried a modern saber, with the long polished steel halberds of centuries ago. The relic was carried past with many signs of reverence and veneration from the spectators and mid a silence that was broken only by the murmurs of lowly spoken prayers.

Immediately behind the reliquary came the nobles and gentlemen, whose costumes I have already endeavored to describe. Individually as they arrived they were unique and showy, but massed together they made a picture of novelty and color to which no camera could do justice. They were followed by many army officers in full uniform and by the

already-described chasseurs, who massed together were but little less brilliant and interesting than the gorgeously arrayed group that had preceded them. Another detachment of infantry brought the splendid cortege to a close.

THE STORY OF THE RAVEN

The procession wended its way through the crowded streets to Matthias Church, where but a small portion of the escort and only those of the highest rank were admitted, as the interior is not large. Around the church was an immense concourse of people, who joined in the service with responses and chanting, as it proceeded inside, priests being stationed at different points to lead them at the proper time. The service lasts some three hours, and while it is going on let us take a look at the outside and into the history of this ancient place of worship. Its foundation stones were laid in the 13th century, and it was started in the Romanesque period. It was not completed until the 15th century, and the style of architecture having then changed to Gothic, it was finished in this school, making rather a queer combination. There are a number of small spires from the period of the original church, all surmounted by large iron ravens, one of which holds an iron ring in his beak. These add a still more peculiar touch to this already odd-looking building. It is to these ravens, or rather to the one with the ring, that the church owes its existence. Way back in the 13th century the consort of King Bela lost a most valuable ring, which she had entrusted to the care of a favorite serving maid. The maid, who could not account for its disappearance, was suspected and convicted of stealing, and, as was the custom of the time, immediately executed. Shortly after her death a raven (one of a flock that made their home about the palace) was discovered playing with a bright object, which proved to be the missing ring that he had purloined through an open window. So great was the grief of the King and Queen at the cruel death of the innocent servant that they vowed to build this church to her memory, surmounting it with the effigy of the real culprit, that all might know of her innocence. During the Turkish domination of Hungary it was used as a mosque. The Turks entirely destroyed the interior, redecorating it to suit their own style of religion; but, strange to say (for it is against the Mohammedan faith to have a representation of a living thing about their places of worship), they did not disturb the famous ravens.

After the service had finished, the procession was again formed in the same order as before, and the reliquary escorted back to its resting place in the Royal Chapel, where it mains until the next 20th of August. The crowd in the streets had waited patiently for another glimpse of the sacred relic, and the same scenes of devotion and veneration were enacted on its return. The religious part of the day being over, the afternoon and evening were devoted to pleasure and merry-making. In the squares and streets near the palace and church, booths had been erected for the sale of merchandise, refreshments, and souvenirs. The latter were all of a religious nature—pictures of saints, sacred medals, shrines, etc., in which the effigy of Saint Stephen always held the place of honor. Later in the day there were music and dancing in different parts of the city, the principal point of gaity being the *Stadtwaldchen*, or public garden, where cafés, shows, and other forms of amusement kept the citizens and visitors entertained until a late hour. Just how late they kept it up we did not wait to see, for with a day begun at daylight, and one with a continual strain on our powers of observation, we were glad to seek the quiet of our hotel.

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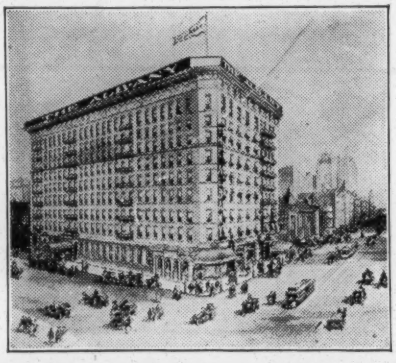

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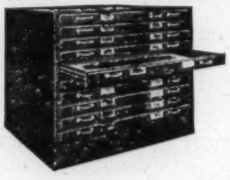

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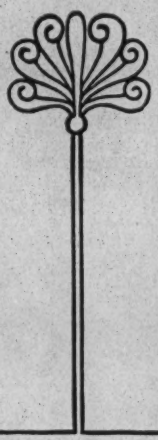

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